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WINNERS
YOUR BEST PHOTOGRAPHY
19TH ANNUAL READERS' CONTEST P.63

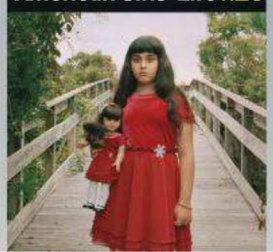
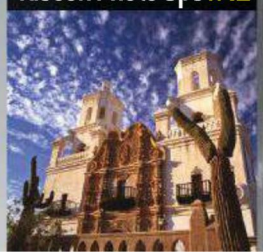
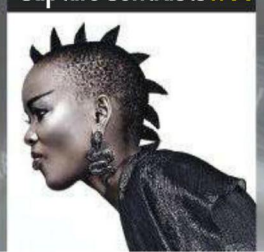
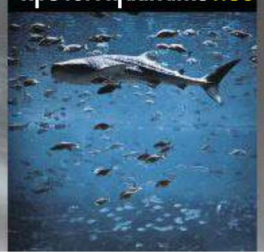
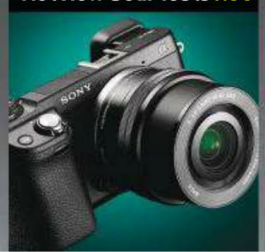
HOW TO MAKE GREAT PICTURES

CAMERA OF THE YEAR
Canon EOS 5D Mark III

Superior low-light ability, serious video capability, and easy handling add up to one awesome DSLR P.58

PLUS
TELEPHOTO LENSES
NEW FOR YOUR DSLR OR ILC
P.84

American Girls' Life P.26
Tuscon Photo Ops P.42
Capture Contrasts P.44
Tips for Aquariums P.50
Hot New Gear Tests P.77

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1.Among interchangeable-lens digital cameras with a full-frame image sensor (as of September 12, 2012) according to Sony's internal survey. © 2012 Sony Electronics Inc. All rights reserved. Reproduction in whole or in part without written permission is prohibited. Sony and the Sony make.believe logo are trademarks of Sony.

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AN EVENING OF CREATIVITY, PASSION & INNOVATION...

Pictured, left to right: Rosie Sandoval (Sony Marketing); Brian Smith (Sony Artisan); Matthew Jordan Smith (Sony Artisan); Andy Katz (Sony Artisan); Kayla Lindquist (Director, Sony Artisan of Imagery); Me Ra Koh (Sony Artisan); David McLain (Sony Artisan); Cristina Mittermeier (Sony Artisan)

Top image, top left to bottom right: Gabriel Johnson (Sony); Ruben Tellez (Sony); Mike Kahn (Sony); Rosie Sandoval (Sony); Erica Johnson; David Wheeler (Sony); Mike Iadanza (American Photo); Matt Parnell (Sony); Misty Cauble (Blue Pixel Creates) Bottom left, left to right: Elliott Erwitt (Photographer); Kayla Lindquist (Sony)

Sony & *American Photo*: Coming Together to Celebrate Photography

In what has become the must-attend event during PhotoPlus Expo, Sony and American Photo welcomed media analysts, professional photographers and industry icons in celebration of the art of photography, as well as the photographic community — whose collective vision shapes the way we see the world.

The evening began with a pre-party ceremony in which Sony was presented with an American Photo Editors' Choice Award for the Sony Alpha a99, and then transformed into a night of revelry where photography took its rightful place on center stage. Sony's Artisans of Imagery, a diverse group of talented professional photographers, and the winners of the Sony World Photography Awards provided a stunning visual backdrop that enveloped the evening's invitees with powerful imagery.

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CONTENTS

HOW TO MAKE GREAT PICTURES JANUARY 2013 VOLUME 77, NO. 1

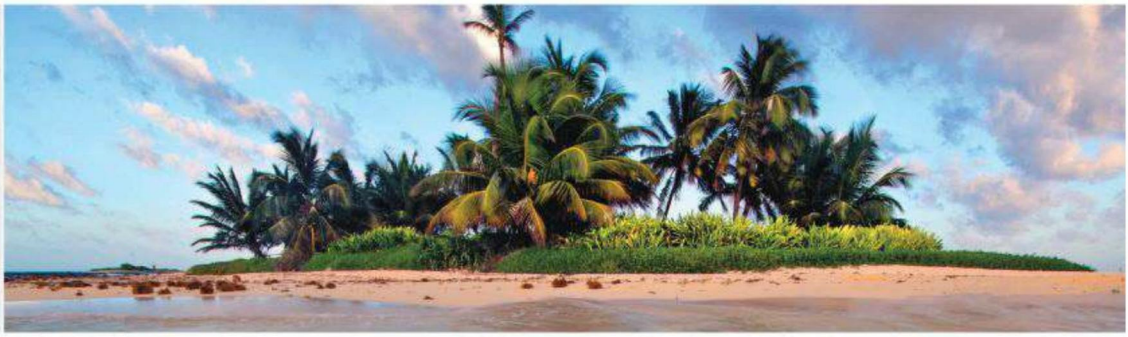
Please Recycle This Magazine

FEATURES

63 THE 19TH ANNUAL READERS' PHOTO CONTEST Our readers wowed our judges with hundreds of great images. Again, you made it (almost) impossible to pick winners! *By Matthew Ismael Ruiz*

58 MODERN MATURITY
With groundbreaking low-light performance and Hollywood-esque video flair, Canon's EOS 5D Mark III grabs Pop Photo's coveted Camera of the Year laurels for 2012.
By Dan Richards

53 A TREK IN BELIZE
Its turquoise seascapes, lush mountain vistas, colorful sea creatures, and exotic jungle wildlife make Belize the perfect winter getaway for every nature and travel photographer. *By Ian Plant*



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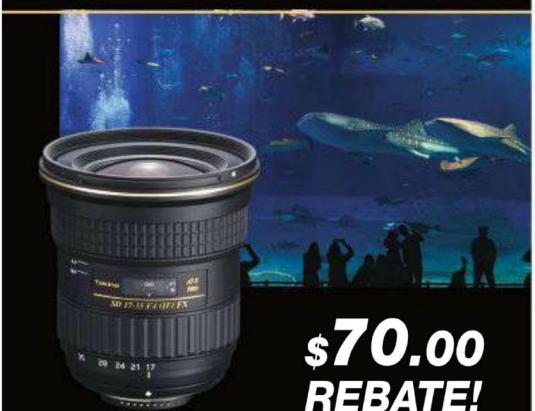

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NEXT

17 WE WANT THIS A bargain 70–200mm Nikon? Get out the plastic!

18 JUST OUT Pentax's cuter Q, a Lumix flagship flash, and a luxe Lomo.

22 ROUNDUP Four new photo backpacks with originality to spare.

SHARE

25 PHOTO CHALLENGE A dragon in the mist wins this month's shadow-laced shootout.

26 MY PROJECT What American Girl dolls reveal about America's girls.

28 I, PHOTOGRAPHER A grand profession, shooting grand opera.

30 LETTERS You chime in on photo career paths, image editing, and questionable cropping.

32 TECH TALK How and why mirror lenses make great donuts. *Really.*

HOW

37 CREATIVE THINKING Watch and wait for those oft-mentioned "decisive moments." They will come.

38 FIX IT FAST Tweak contrast and exposure for a better black-and-white.

40 TIPS & TRICKS Choose manual exposure for snow scenes.

42 TRAVELING PHOTOGRAPHER Explore Tucson for its colorful landscapes, great architecture, and—yes!—warm weather.

44 LIGHTING Use the right lights for high contrast and high glamour.

46 SOFTWARE WORKSHOP Discover the fun of tablet-based editing with Snapseed and Perfectly Clear 3.

50 YOU CAN DO IT Try these tips for more awesome aquarium pix.

LAB

77 ILC TEST Sony Alpha NEX-6 This new model doesn't disappoint: Get the NEX-7's top features at a lower price.

82 DSLR TEST Sony Alpha 99 Sony woos pros with this talented full framer, but will it win converts?

84 LENS TEST Sigma 18–250mm f/3.5–6.3 DC Macro OS HSM Sigma shrinks a favorite super zoom.

86 HANDS ON Tokina Reflex 300mm f/6.3 MF A Micro Four Thirds tele with 600mm reach and 90mm size.

DON'T MISS . . .

8 EDITOR'S LETTER
12 SHOWCASE
102 TIME EXPOSURE
112 BACKSTORY

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Decisions, Decisions

When the editors of *Popular Photography* sat down to hash out our choice for the 2012 Camera of the Year, we ended up with one of the tightest contests we've had for this annual honor in the seven years I've been here. After all, in the past 12 months, we've seen a bonanza of marvelous imaging machines, from innovative advanced compacts such as Sony's Cyber-shot RX1 to chart-topping professional DSLRs like Canon's EOS-1D X to the *sui generis* Leica M Monochrom. It proved surprisingly difficult to name the one camera that *best refined or redefined photography* in 2012—our sole criterion.

My colleagues and I narrowed our list, counting only those we had subjected to the rigors of our lab and field testing during the past 12 months. Of those, we pulled the three strongest contenders—and, still unable to decide on a single Camera of the Year, had all three of them photographed by Satoshi, our newsstand cover artist. (If you want to watch a brief animation of his portraits of the finalists, follow the directions at the bottom of this page to get our smartphone app, PopPhoto Interactive, and use it with either the cover of the newsstand edition or the opening spread of the article on page 58.)

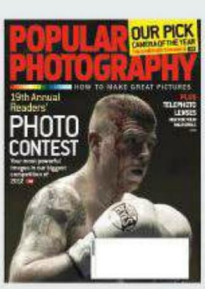
With the cameras back in our hands after Satoshi's shoot, we spent the better part of an afternoon debating their relative merits and weaknesses. Which would win out: Astonishing low-light performance or super resolution? Blazing speed or raw power? Innovation or execution? Process or results? As Senior Editor Dan Richards explains in his article, in the end we balanced all of these concerns and picked...well, you know. It's on the cover.

But after all this camera talk, what really refines and redefines photography isn't the gear that captures an image. It's the image itself. And we devote our January issue each year to the best of *your* photography in the form of our Annual Readers' Photo Contest. Our whole editorial and art staff considered thousands of entries, and our debate this year took many hours and plenty of bagels at the conference table. Want to see what we saw? All of the submissions are posted on our website at PopPhoto.com/ReadersContest2012, along with a gallery of the finalists in this tough competition; the article on page 63 opens with thumbnail crops of both finalists and winners.

Miriam Leuchter

What is This?

With Aurasma, we've created PopPhoto Interactive, a free Android and iOS app that bridges print and digital. It uses image-recognition software to launch video or other enhanced content on your camera-equipped smartphone or tablet. Search for it at the app store, and look for this icon in our editorial and advertising pages to tell you when to use it.



NEWSSTAND Canon takes top honors with its 2012 Camera of the Year, the EOS 5D Mark III, photographed by Satoshi. Find out why it won on page 58.

SUBSCRIBER Tri Nguen's powerful ringside portrait of Todd "White Lightning" Wilson won the Action/Sports prize in our Annual Readers' Photo Contest, page 63.

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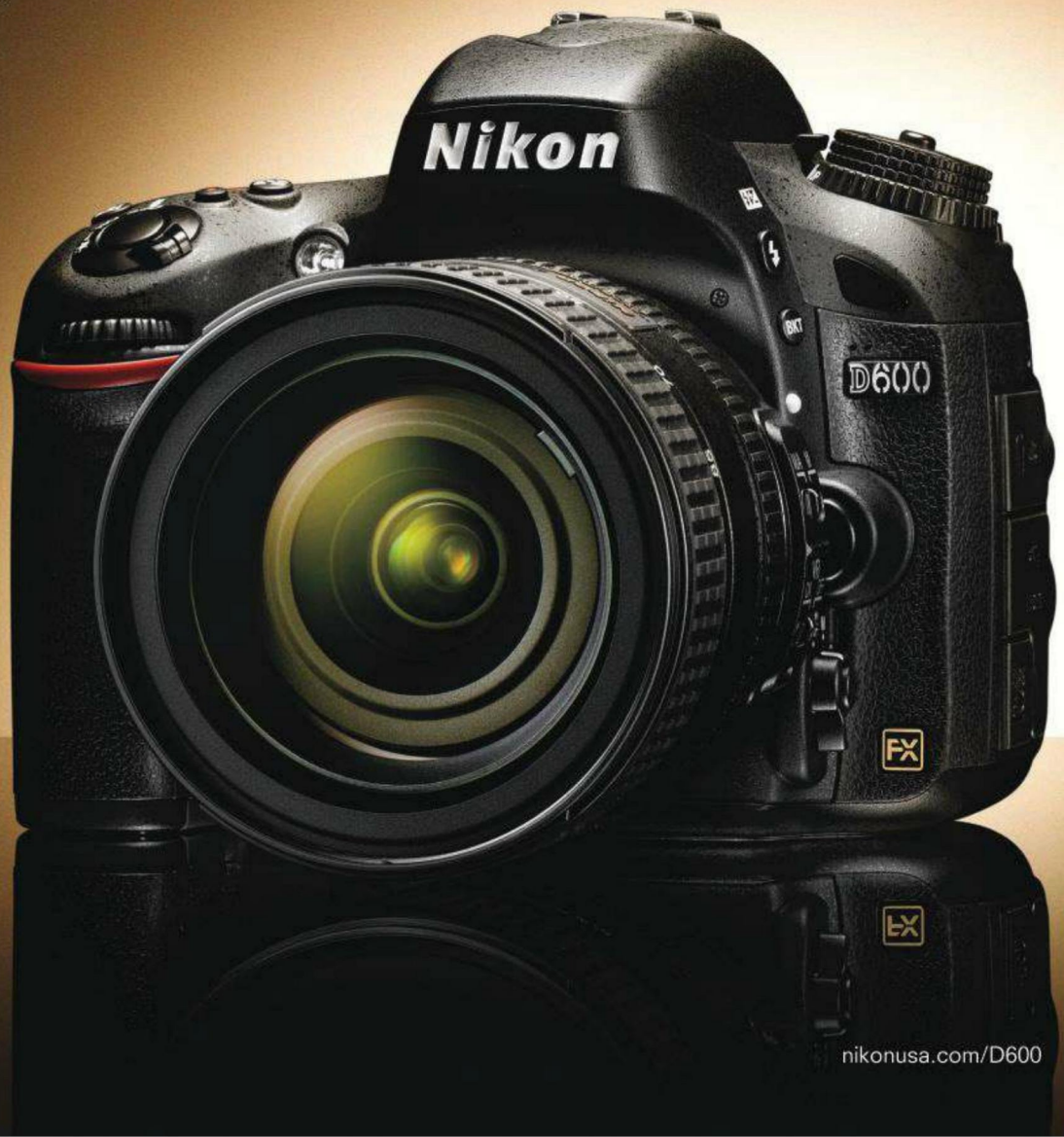

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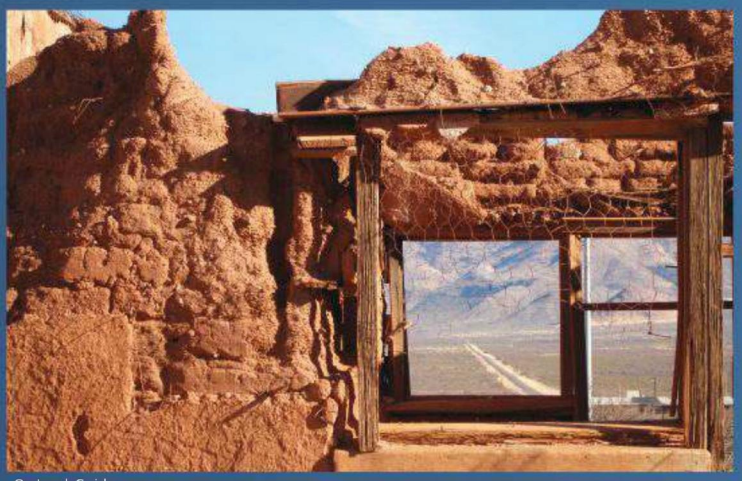

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LONE CYPRESS Native to the central coast of California, Monterey Cypress (Cupressus macrocarpa) have become an regional icon. Technical Editor Philip Ryan shot this vista with a Sony Alpha 99, mounted on a Joby GorillaPod Focus and set to ISO 200 and a shutter speed of 6 sec. His lens? A 24–70mm f/2.8 Sony ZA SSM, with a Tiffen circular polarizing filter, racked out to 70mm and stopped down to f/16. For our lab test results of the A99, see page 82.

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LOMO GOES AUTO—IN MEDIUM FORMAT 20

A ROUNDUP OF CAMERA BACKPACKS 22

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IF YOU'VE spent a day carrying around Nikon's awesome 70–200mm f/2.8, you've probably wondered if you really need that fast constant aperture. If so, then its new 70–200mm f/4G ED VR AF-S Nikkor lens ($1,400, street) is made for you. At a mere 30 ounces, it's about 45 percent lighter than its faster cousin. Plus, it's about an inch shorter.

Other than a stop of light and a shallower possible depth of field, you don't really give up much by going with the f/4 instead of the f/2.8. Both lenses employ Nikon's rugged Nano Crystal Coating and sport nine-bladed diaphragms. And both focus internally using Silent Wave motors for quiet focusing that won't interfere with accessories mounted in the filter ring.

Price-conscious? Note that the f/4's smaller (67mm) filter size makes for less-expensive filters. You will also notice that the new lens costs almost $1,000 less than the f/2.8. And if the f/4's third-generation stabilization system bests the previous version, that extra stop of light might not even matter.

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BIGGER BABY

Pentax's cute Q system gets a new body

THE Q, Pentax's first crack at an interchangeable-lens compact, was so tiny and adorable that it bordered on caricature—its lenses were even dubbed "toys." The updated Q10 posts familiar specs: the same 12-bit RAW capture; 3-inch, 460,000-dot LCD; 1920x1080p30 video; micro HDMI port; and pop-up flash.

So what's new? For starters, the redesigned body, which is slightly larger. Sensitivity range expands on the low end, becoming ISO 100–6400. But most interesting is the new contrast-detection autofocus system, with 25 AF points and an upgraded algorithm for faster performance.

For Pentax shooters who have a plethora of K-mount lenses, Pentax is offering an optional Q-to-K mount adapter ($249, street). The customizable Quick Dial gives access to your favorite shooting modes, and by dialing in the focal length of the mounted lens, you can take advantage of the Q10's sensor-shift shake reduction.

Given the small size of the Q10's sensor, even at what seem like wide apertures you might find it difficult to render parts of your scene sufficiently out of focus—so Pentax fakes it with an in-camera "bokeh control filter."

Pentax Q10
$555, street with 5–15mm lens
pentaximaging.com

MASTER FLASH

New Panasonic TTL unit brings wireless flash to the GH3

WITHOUT A DSLR in its lineup, Panasonic stuffed plenty of professional features for both stills and video shooters into its flagship ILC, the Lumix GH3. With the new DMW-FL360L flash, you can add a constant LED video lamp and wireless flash control (see Inside Tech) to the list.

A built-in wide panel/catch-light plate expands the flash's coverage down to 8mm (16mm equivalent) from 14–24mm (24–84mm equivalent). For bouncing light off of walls and ceilings, the FL360L's head tilts from 7 to 90 degrees and swivels 180 degrees in each direction.

Powered by four AA batteries, this TTL flash unit recycles every 2 seconds, has a guide number of 36 (ISO 100), and can operate in focal-plane mode for high-speed flash syncing and shooting at wide apertures even in bright scenes.

Panasonic DMW-FL360L
$300, street
panasonic.net

NEWS FEED

> Classic notebook firm Moleskine now makes photo books with PQ Publishers. For $50+ up to 10 online collaborators can build a hardcover.

INSIDE TECH

Cut the Cord

When used with Panasonic's Lumix GH3, the FL360L can serve as a wireless commander unit, remotely firing up to three groups of wireless flashes without needing to fire itself, and it can also be used as a slave flash. Settings such as firing, dimming and exposure compensation are configured through the camera's menu.

MetalPrints

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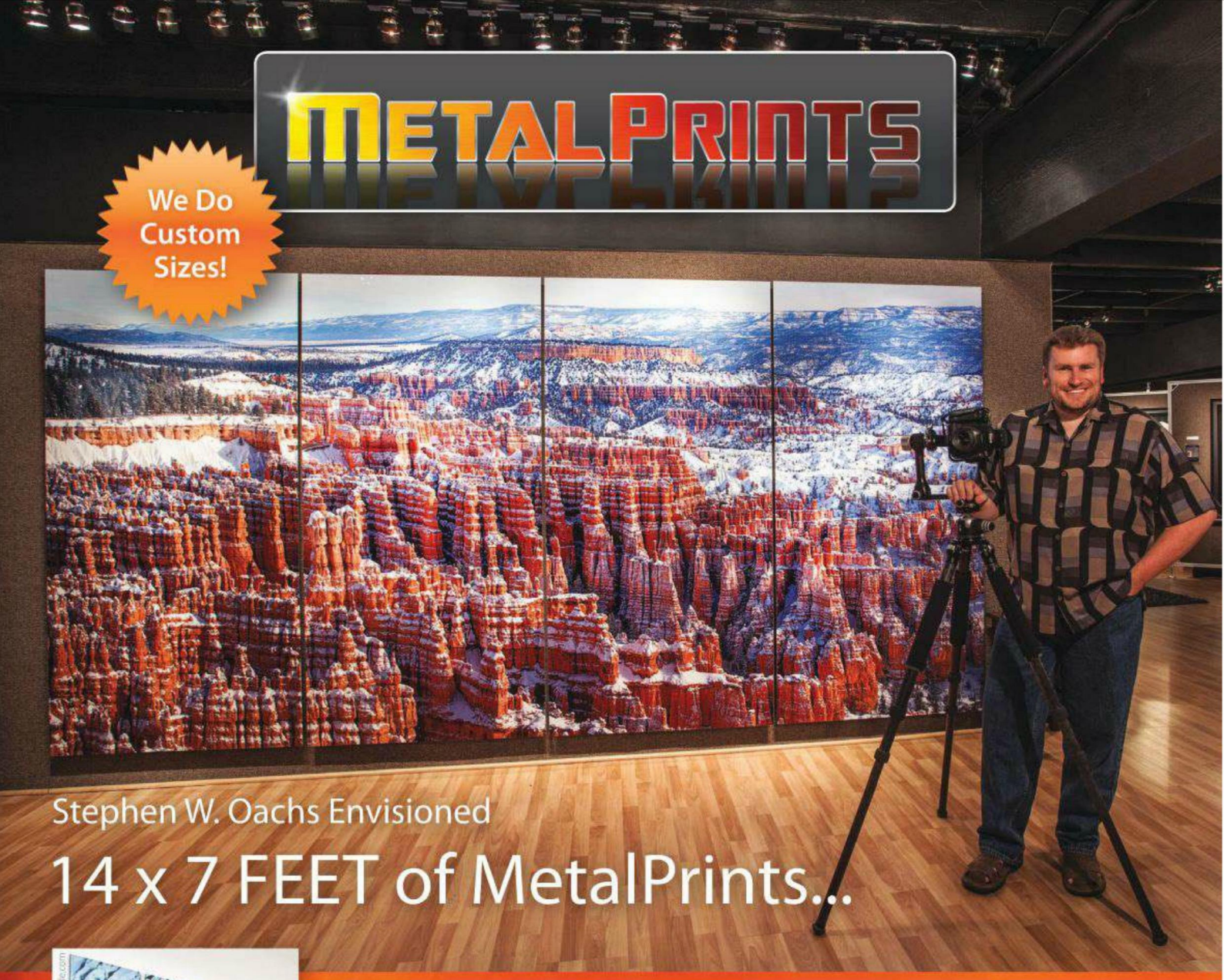
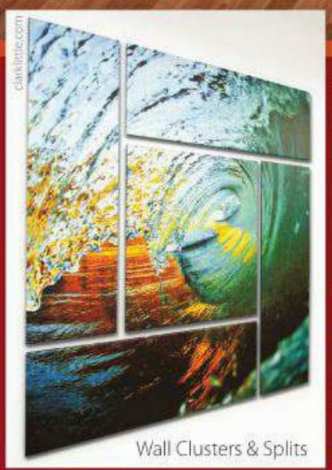
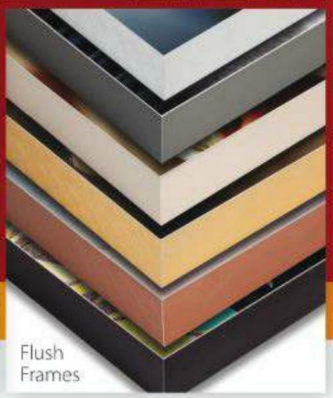


Stephen W. Oachs Envisioned

14 x 7 FEET of MetalPrints...





"And here we have it -- a quadtych of my 551 mega-pixel multi-row panoramic of Bryce Canyon from the winter of 2010. This print is 14 x 7 feet and there is NO pixelation. If you stand even a few inches away it's perfectly clear and sharp. The resolution on this is stunning. My good friends at Bay Photo Lab spent the last few days creating this high gloss print on metal for my gallery at Aperture Academy."

- Stephen W. Oachs, apertureacademy.com

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WE'RE HERE FOR YOU!

AUTO LOMO

Retro-looking snapshots, medium-format style

THIS ISN'T your mama's Holga. Lomography's new Belair X 6-12 medium-format film camera promises resolution and control that Lomo's 35mm plastic-lens and pinhole models can't match.

The Belair uses a bellows that collapses down when not in use, and it can take 120 film at 6x6-, 6x9-, or 6x12cm frame formats.

Belair X 6-12 City Slicker
$249, street
usa.shop.lomography.com

Lomo claims this is the first 6x12 camera with an automatic shutter—but speeds top out at 1/125 sec. Of course, this is Lomography, so there are modes for long and multiple exposures; it meters at ISO 50–1600.

The Belair ships with 90mm f/8 and 58mm f/8 lenses. The City Slicker model (shown) is made of black plastic; a metal and leather one costs an extra $50. Both include a hot-shoe for an external flash unit.

ANOTHER ONE

Nikon refreshes the flagship model for System 1

AFTER updating its J line with the J2 a few months ago, Nikon has now announced the V2. The pixel count rises to 14.2MP, burst shooting jumps to 15 fps, and the grip has grown, lending a superzoom-type feel. The pop-up flash is mounted on the front of a 1.4 million-dot EVF, while mode and command dials have been added to the top of the camera.

All the fun features of the System 1 remain, including Motion Snapshot. Plus, a new accessory flash called the SB-N7 ($160, street) can add more light to your rig if you want it.

Nikon 1 V2
$900, street, with 10–30mm lens
nikonusa.com

NEWS FEED

> Canon's new firmware update for the EOS 5D Mark III—available for download in April 2013—allows for uncompressed HDMI output to external recorders and monitors, and nifty AF updates that enable use of center cross-type points when using teleconverters.

> For the first time, Nikon's International Photo Contest is not accepting film submissions. The contest welcomes digital submissions up until February 28, 2013.

> Google Maps is creating a Street View of the Grand Canyon using the Trekker backpack contraption, a cluster of 15 5-megapixel cameras that shoot every 2.5 seconds.

> Carry Speed has released the MagFilter, a magnetic system that allows filters to be affixed to compact cameras.

CAPTURE ONE 1 PHASE ONE

New Software

Phase One Capture One Pro 7

Taking a cue from Apple Aperture and Adobe Photoshop Lightroom, Phase One's new editing tool adds cataloging features, letting you organize, tag, and sort your photos. The 64-bit software ($299, direct; $99, upgrade; www.phaseone.com/capture-one) also adds support for Retina-level resolutions. A Smart Lighting control automates exposure adjustment for what Phase One calls "vastly more accurate redition of details and colors."

THE LOWDOWN

HI-DEF NOMENCLATURE

The Consumer Electronics Association's Board of Industry Leaders has decreed that the next generation of "4K" (3840x2160 pixels) high-definition displays will be dubbed "Ultra HD." With eight million pixels of resolution, Ultra HD displays will have at least four times as many of pixels as current 1920x1080p "Full HD" models.

SIGMA

2012 WALTER ARNOLD. CAMERA : SIGMA SD15 : ISO100, F6.3, 1/80sec | LENS: SIGMA 18-250mm F3.5-6.3 DC MACRO OS HSM : 250mm

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*Optical Stabilization not available in Sony and Pentax mounts

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TREK PACKS

NOT LONG AGO, photo backpacks were undisguised facsimiles of those made for hunters and hikers. Rugged and high-capacity, they were functional but stylistically blah. Happily, today's photo backpacks are loaded with clever features *and* style. Here are a few recent faves.

THINK TANK'S GLASS LIMO
Configure it as a regular backpack (shown) or as a super-tele lens case.

Brenthaven BX² $180

Most of the packs here have pockets for an ultrabook or laptop, and the BX² accepts one as big as 15.4 inches. It also has a foam-cushioned base, tripod harness, top handle, and pull-out rain cover. What we like best? The LED light that's tethered to the inside front flap. With it, you can search through the pack's contents in desert darkness.

Think Tank Glass Limo $196

Conceived as a limousine for lenses, the Glass Limo is shaped like an outsized lens case with shoulder straps. Think Tank claims it's the smallest and lightest backpack to haul a 600mm f/4 supertele. Touch-fastened collars hold lenses securely, and for non-tele outings there are the usual dividers for camera, lens, and flash compartments.

Kata Revolver-8 PL $250

The biggest novelty in recent backpacks is this one's revolving magazine that holds up to eight photo accessories. To retrieve, let's say, a lens, you unzip a side access door and spin the magazine until the desired lens lines up with the opening. Remove a central baffle, and it can accept a DSLR with lens attached.

Lowepro RoverPro 45L AW $329

Unusually light, with an indescribable but undeniable high-tech feel, this high-priced jewel appears to be worth every cent. Its trampoline-like suspension system stabilizes the load for rugged terrain, the internal laptop compartment is suspended to cushion against shocks, and two removeable cases let you instantly switch kits.

NEWS FEED

> Party, a Japanese design studio, opened a pop-up store in Tokyo's Harajuku district called Omote 3D that uses a 3D printer to produce action figures of customers in 15 minutes for $400.

> Sharing photos of your kids just got easier—the new version of Facebook for iOS (5.1) finally lets you upload multiple pictures at once.

> The Columbus Museum of Art is showcasing 30 Instagram images inspired by *The Radical Camera: New York's Photo League, 1936–1951*, in its Community Gallery.

> LaCie's self-proclaimed "sexiest" drive to date, LaCie and Porsche Design's P'9223 Slim SSD boasts transfer speeds up to 400MB/s, USB 3.0, and a thin aluminum body. 120GB SSD models start at $100.

TOOLBOX

THIN IS IN

New Cokin filters stop lens flare—with no vignetting

FRENCH OPTICAL filter maker Cokin claims that its new Pure Harmonie filters are the smallest and lightest photo filters in the world. How thin? The Multi-Coated Anti-UV ($27–$48, street) measures 3.3mm; the Circular Polarizer ($54–$83, street), 4.5mm; and the Variable Density Neutral Gray shown ($104–$203, direct), a mere 9.5mm deep.

Threaded to fit your lens instead of using Cokin's famous holder system, they come in sizes 37–82mm for the UV and polarizing filters, and 52–82mm for the variable ND X. The latter lets you select the intensity from ND2 (1 stop) to ND400 (8+ stops) by rotating its front ring. All the Pure Harmonie filters are multi-coated with Cokin's Everclear 5 for resistance to scratches, water, oil, dust, and soil.

2.2

Average number, in thousands, of images stored by point-and-shoot owners on PCs or other devices

19.9

Those, in thousands, by DSLR owners

SOURCE: InfoTrends

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Tough
TG-1 iHS

getOlympus.com

*Among digital cameras with interchangeable lenses available as of February 8, 2012, when using the OLYMPUS M. ZUIKO DIGITAL ED 12-50mm F3.5-6.3 EZ lens with the E-M5, based on Olympus in-house measurement conditions. **As of May 1st, 2012.

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What makes MeridianPro different?

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This is only a small sample, Meridian offers over 80 print sizes, with panoramic sizes up to 120 inches. That's correct, true photographic prints, lab corrected, as large as ten (10) feet long.

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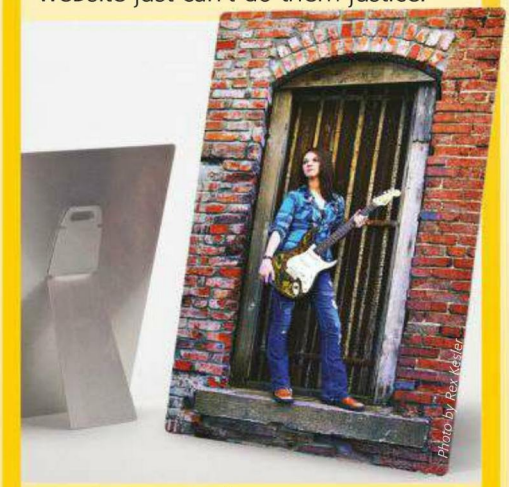

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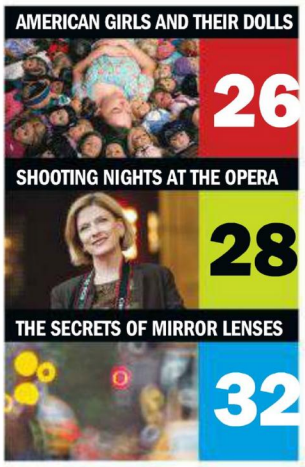


PHOTO CHALLENGE

MORNING MIST

CLAUDIU GURALIUC, GURALIUC.WIX.COM/PHOTOMANIAC

A bank manager captures his country as it wakes

SOMETIMES THE best inspiration is admiration. And Claudiu Guraliuc, 35, of Romania admires his friend, Mihai Grigorescu, who has taken many beautiful images of foggy mornings in Romania's Maramures county, Guraliuc says.

Determined to get his own depiction of northern Romania's natural beauty, Guraliuc battled long distances, wind, and low light to make this photo of an old church and what he describes as a "dragon-shaped" cloud hovering above the ground.

With an 80–200mm f/2.8 Nikkor AF-D lens on his tripod-mounted Nikon D700, he avoided camera shake by using mirror lock-up and a cable release to take this shot at 1/25 sec and f/16, ISO 200.

Guraliuc adjusted contrast and clarity in Adobe Camera Raw, burned in Photoshop CS5, and tweaked contrast in Nik Color Efex Pro 4.

Elegantly capturing the rising sun burning through the morning fog, the resulting photo answered our call for your best naturally lit low-light image. What else did he capture in the scene? "I still see a long dragon in the mist," he says.

—Matthew Ismael Ruiz

NEXT PHOTO CHALLENGE **On page 40, Vincent Soyez turns falling snowflakes into breathtaking glowing orbs. Send us your best shots of falling precipitation by January 31; you could win $100 and your photo here. Go to PopPhoto.com/contests for rules.**

Girls & Dolls

American girls with their American Girls

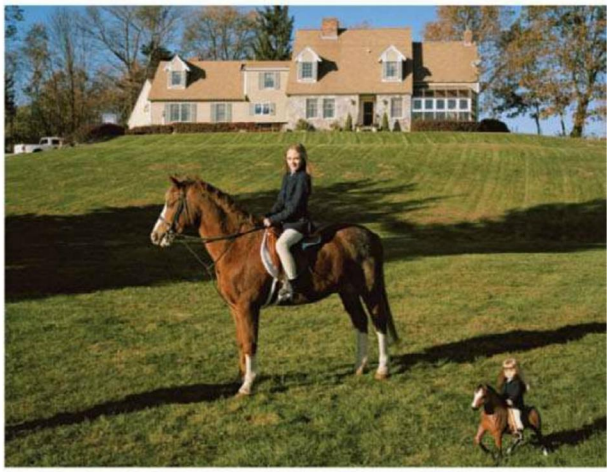
WHEN ILONA SZWARC moved to New York City from Warsaw in 2008, her goal was to be a street photographer in the tradition of her heroes Garry Winogrand, Joel Meyerowitz, and Bruce Gilden. So, like them, she began shooting the crowds along Fifth Avenue.

Now 28, Szwarc might not have known she was shooting near the flagship American Girls doll store had she not noticed a trend pop up in her images—little girls, all holding dolls that look like they do, customized in hair and skin color as well as fashion. After stopping a few of them to learn the story, she became fascinated.

"Being in the U.S. made me wonder about what it means to be a woman here and what it means to be American," Szwarc says. "An 'American Girls' product creates a stereotype of who a contemporary

See more of Szwarc's American girls at ilonaszwarc.com.

ILONA SZWARC; MATTHEW LEIFHEIT (HEADSHOT)



Szwarc works with a Toyo 45 CF 4x5 field camera, 90mm f/6.8 Rodenstock Grandagon and 135mm f/5.6 Nikkor-W lenses, and Kodak 160 and 400 Portra NC films.

American girl might be, and this made me want to investigate who these girls *really* are."

At first she approached girls—and their parents—to capture them on the street; later, she started to arrange shoots of the girls in their homes. As the project grew, she began posting about it on American Girls fan pages and Facebook. On a shoot, she'd spend time learning about her subjects, then let them surprise her with how they wanted to be photographed before setting up her 4x5 field camera.

Sometimes there were obvious similarities between the girl and her doll. Other times, the match felt nebulous. "The most popular ways you're supposed to play with these dolls is traditionally feminine and domestic—playing dress-up, having tea parties, taking the doll to the hair dresser," Szwarc says. "It made me realize what the impact this can have on young girls as they're growing into adulthood."

Having now photographed nearly 100 American girls, she has found that no one fits a stereotype. A personal favorite: Jade (not shown here), a self-described tomboy who dresses her doll at more gender-neutral stores like Build-a-Bear. "She treats her doll like a daughter, and she doesn't want her dressing up and going to tea parties," says Szwarc. "Her style and personality are her own." ***—Lori Fredrickson***

DAN BRACAGLIA

Stage Hand

Shooting the Metropolitan Opera

Marty Sohl is one of two main photographers for the Metropolitan Opera in New York City, where she lives during the season (September through May). Off-season, she lives with her family and dogs in Fort Worth, TX. See more of her work at martysohlphoto.com and at PopPhoto.com/sohl.

How did you start shooting for the Met? I shot the San Francisco Opera for 20 years and developed a relationship with the Metropolitan Opera. They invited me to come and do a shoot—like a tryout—and it worked.

What led you to opera photography? I started out as a dancer with a little ballet company in San Francisco. I was sitting around watching rehearsals a lot, so I got myself a camera and started playing around with it. I started shooting performances, went to the San Francisco Ballet, and shot a couple of rehearsals. The San Francisco Opera saw those photos, asked me to do a test shoot, and they liked my work. That was 1982.

How well do you have to know the operas? I've been doing it so long that I know a lot of opera stories, but I'm not an expert. I just go with my instinct. It helps to do a few rehearsals—and to know the story, of course. Mostly I just keep my camera focused on the performers, and when they do something exciting or dramatic or touching, then I shoot. I shoot a lot.

How many frames? For a full dress rehearsal, as many as 1,500 to 2,000. There are so many variables. You think you've got the moment perfect, and when you look at it, somebody's doing something: They're licking their lips, their eyes are closed.

Do you move about the theater? At some of the final dress rehearsals, there's an audience, so it's hard to move around. For those, I stand in the photographers' section. But for earlier rehearsals, we have access to pretty much all of the theater: We can go way downstage right or left, up to the boxes or the parterre section for different angles, or up above to see the set.

What gear do you use? I just bought a Canon EOS 5D Mark III that I love. It's the best so far for me—the quality of the files in dark lighting is so much better than my previous cameras, it's amazing.

Do you have any say on the lighting? We shoot with available light on the stage—we don't have any control over the lighting at all. The hardest part is when there are pools of very bright light and parts of the stage are really dark—that makes it hard to expose correctly. When it's lit very bright and flat, it's harder for me to get a good, sharp image than when there's a little contrast. I like contrasty lighting.

What makes opera photography special for you? I love the grand sets of opera—the colors, the lighting, the grandeur. It's really exciting to me.

How do you capture that? I zoom out my 24-70mm f/2.8 USM. Or I get farther back in the theater and try to get full stage shots, stopping down a bit to get deeper focus. Quite often, I get the best full-stage shots during early dress rehearsals, where I have access to the center of the theater.

How much editing do you do? I use Adobe Photoshop Lightroom 4, mostly to lighten and sharpen and to clean up the shadows. Then I'll export photos chosen for the press to Photoshop and do more touching up, removing obvious wig lines or distracting things. Occasionally I have been known to make a singer look a bit thinner, but not often [*laughs*]!

Which operas are your favorites? The old ones, with the big stage filled with hundreds of people. I really love *Turandot* and *Aida*. There's a trend in modern operas toward sparse sets, and they're fun to shoot, but I really love the old grandeur of the opera. A beautiful stage and all those lights. The best singers in the world.

—Interview by Jon Blistein

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Lastolite
Professional

Tom Bol and Lastolite Professional.

Image on left taken with Ezybox Hotshoe shown above, designed to work with most flash guns.

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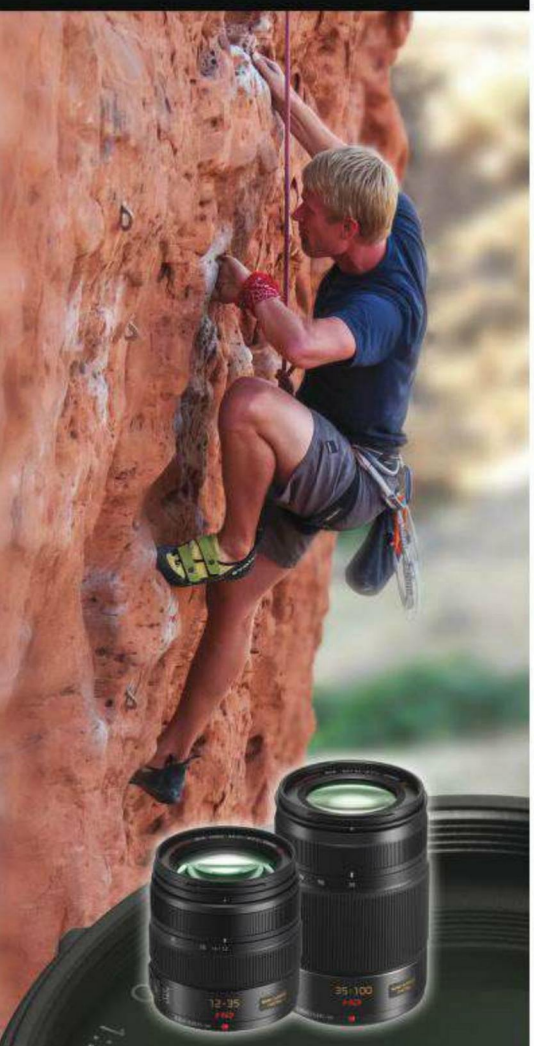

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Career Path

I just wanted to let you know how much I enjoy reading the I, Photographer article each month. My interest in photography is in its early stages; however, it is quickly becoming a decision as to whether I would like to make a career of it. It does help that some of my interests in this section have been the same (Formula 1 takes the cake!). On the subject of my interest in photography, I must say that your awesome magazine on my iPad has played a key role in developing that interest.

Todd Lane
Newcastle, Australia

CONCERNING THE March 2012 issue about manipulating photos and the story on the cover shot of a Fujifilm X10: Anyone could see that the photo was manipulated, but it was nevertheless eye-catching. One subscriber wrote in saying that he was completely turned off by the story, and if your subscriber base wanted info on Photoshop, they would go out and buy a magazine on Photoshop. I for one, enjoy the information that many times provides shortcuts to fixing or manipulating photos to match the idea you have in your head. The recent article you had on resizing photos was extremely helpful in understanding when and how to make changes.

Ken Sylvia
New Bedford, MA

I DISAGREE with Dan Richards' and Debbie Grossman's redo of Alex Sneiders' fine photo ("Sky Lab," Fix It Fast, November 2012). The Before photo draws one's eye from bottom to top elegantly, with no distractions at the top. However, Dan and Debbie feel it necessary to crop that elegant sweep into a mishmash that includes a very distracting white sky at top—after removing a roof overhang in Photoshop. Then they unnecessarily cropped using that hallowed dictum, the Rule of Thirds. However, everyone who has ever taken a photo class has been advised that "the only rule is to break all the rules." Well, I say it's time to break the overly confining Rule of Thirds.

Jay Aldrich
Minden, NV

POPULAR PHOTOGRAPHY

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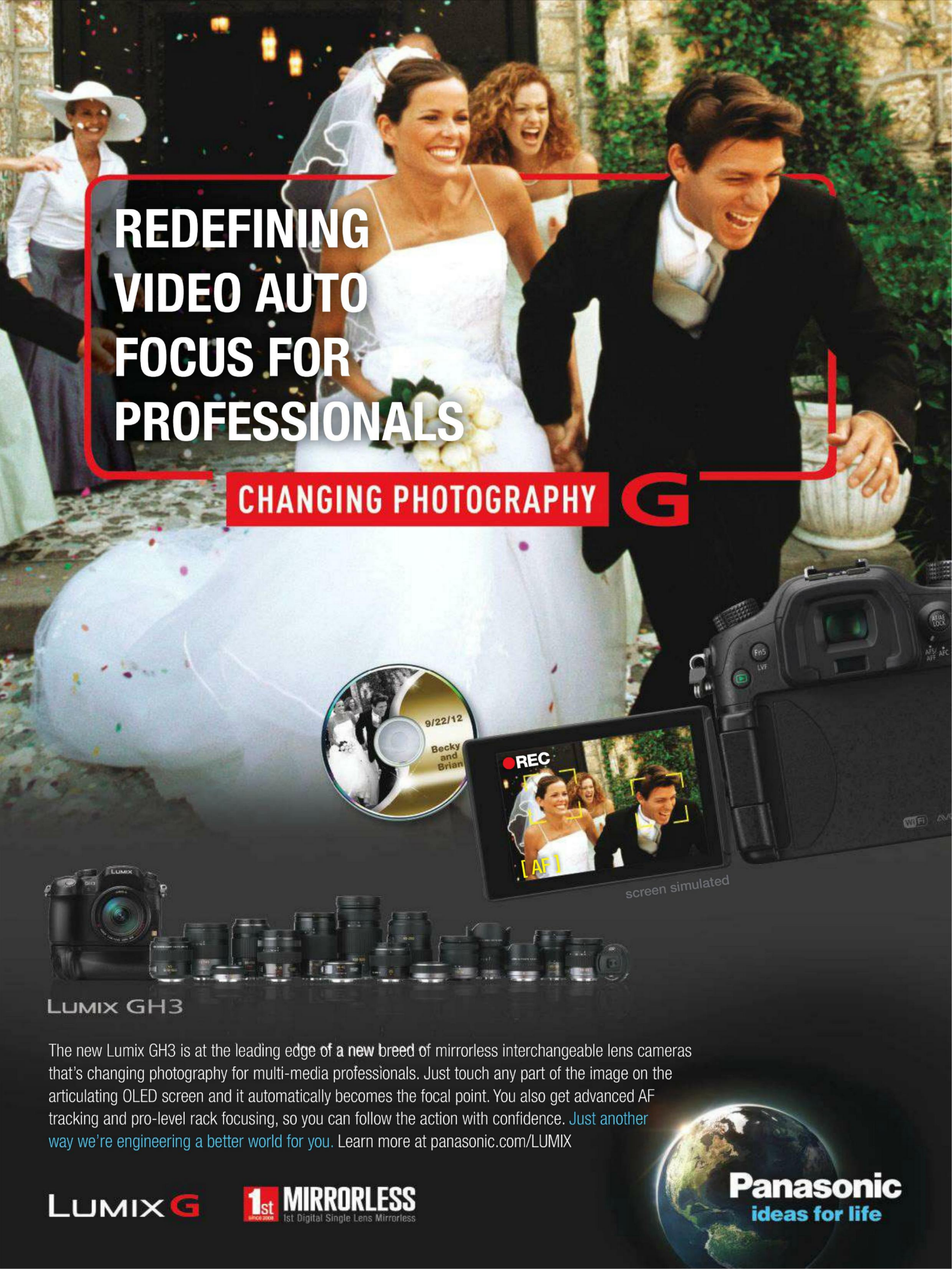
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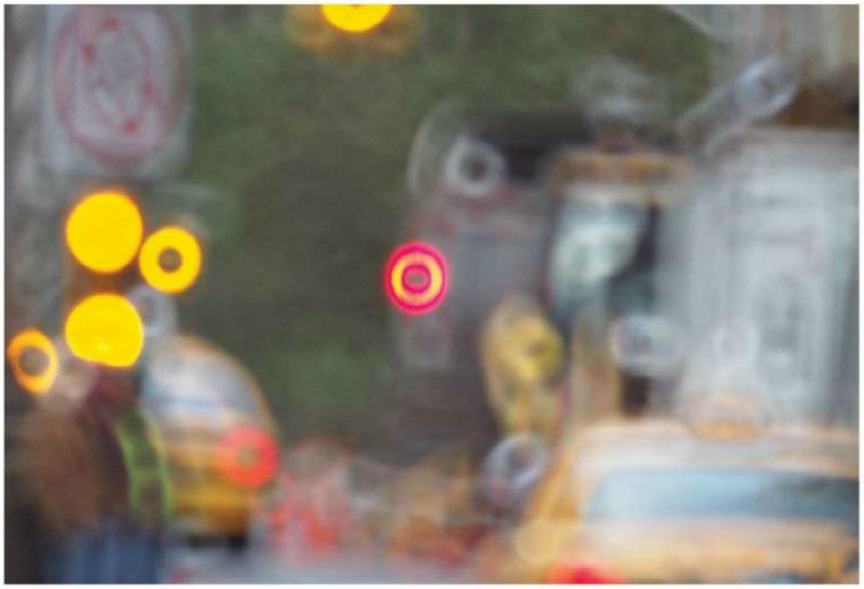


Mirror, Mirror

ONE OF THE BEST things about digital photography is that it can be adapted to all sorts of old gear. Want a digital Leica rangefinder? You got it. A digital back on your wooden field camera? It can be done. A 50-year-old screw-thread Pentax lens on your digital SLR? *No problemo.*

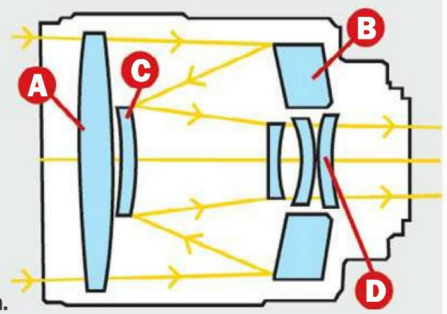
The latest bit of old technology to find a digital purpose is Tokina's reflex, or mirror, lens designed for Micro Four Thirds mount, reviewed on page 86.

Properly termed (take a deep breath) Maksutov-Cassegrain catadioptric ("cat") lenses, these optics were originally designed as compact astronomical telescopes and are still marketed as such. Shortly after World War II the design was adapted for photographic lenses, and new versions of these cats pop up with some regularity. There are also tons of them available on the used market.

The supreme virtue of such lenses is their compactness (at least lengthwise). With the light path folded in three (see the schematic below) these lenses can be drastically shorter than conventional (refractive) lenses of the same focal length. They found some early favor among

FOLLOW THE BOUNCING LIGHT PATH IN A CAT LENS

Catadioptric lenses are so called because they employ reflective elements (mirrors) as well as refractive elements (lenses). Light enters the lens through a front element called a corrector plate (A). The light then strikes the primary mirror (B), which reflects it onto the secondary mirror (C) mounted on the center of the corrector plate. The image then goes through a group of refractive elements (D), which focuses it on the sensor or film.



DAN RICHARDS

photojournalists, sports, and wildlife shooters for this reason.

They do have their quirks, though, and outright drawbacks.

The best-known quirk is their tendency to form out-of-focus highlights into donut-shaped blobs, a consequence of the secondary mirror blocking light rays from the center of the front element of the lens.

These donuts are usually not that much of a distraction; they are most evident in photos taken at close distances with a background far away from the subject. For fun, you can throw a mirror lens radically out of focus, and turn city lights and similar scenes into donut abstracts, as in the photo at left.

Mirror lenses are limited to one, and only one, f-stop—and a dim one at that. You adjust exposure with the shutter speed (either in manual, aperture-priority, or program exposure) and can use neutral-density filters for further adjustment. Strictly speaking, these lenses have no aperture, as there is no diaphragm to put an aperture in.

Nearly all cat lenses are manual-focus only, with the sole exception of the discontinued 500mm f/8 Minolta Maxxum AF Reflex. (Note to Sony DSLR users: This lens will fit your cameras, and was made under the Sony brand for a while.)

The optical design of mirror lenses also makes them harder to handhold steadily. Unlike conventionall refractive teles, whose optical center is near the middle of the lens barrel—about where a tripod collar would go—cats have optical centers out in space, in front of the lens. As a result, handholding a cat lens is something like holding a long conventional lens by its barrel near the lensmount. Hand shake gets magnified accordingly.

If your camera has built-in (sensor-shift) image stabilization, by all means engage it when handholding a cat lens. But, obviously, these lenses are best used on a tripod.

While the length of mirror lenses is well under control, the girth sometimes is not. The longer the focal length and faster the f-number, the fatter the lens. A monster like the 1000mm f/6.3 Mirror-Nikkor has to be seen to be believed—would you believe a 224mm front filter ring? Most mirror lenses, however, are pretty reasonable in bulk and weight.

The bottom line: While we would not recommend these lenses as workhorses for serious shooting, they can provide plenty of supertele fun in an easy-to-carry package.

Q&A Roses are RGB

Q Why do digital sensors use "additive" RGB (red, green, blue) microlens filters instead of "subtractive" CMY (cyan, magenta, yellow) filters?

Joseph LeClaire
Bemidji, MN

A *RGB may well be hard-wired: Human color vision uses red-, green-, and blue-sensitive cones on the retina. And additive (RGB) color theory predated the invention of photography, so it was very much in the air among scientists. The first legitimate color photo was made by James Clerk Maxwell using RGB filters. The first commercially viable color process, Autochrome, used glass plates coated with tiny grains sensitized for three additive primaries. That's similar to how TV screens make color images from red, green, and blue phosphor dots. When Bryce Bayer of Kodak invented a color filter array for digital sensors, he used RGB. So it may have been a matter of coincidence enshrined as convention. But as our color-accuracy tests show, it's a convention that works very well indeed. The CMYK system (K for black) works better for printing four layers of color dots, but that's a whole 'nother story.*

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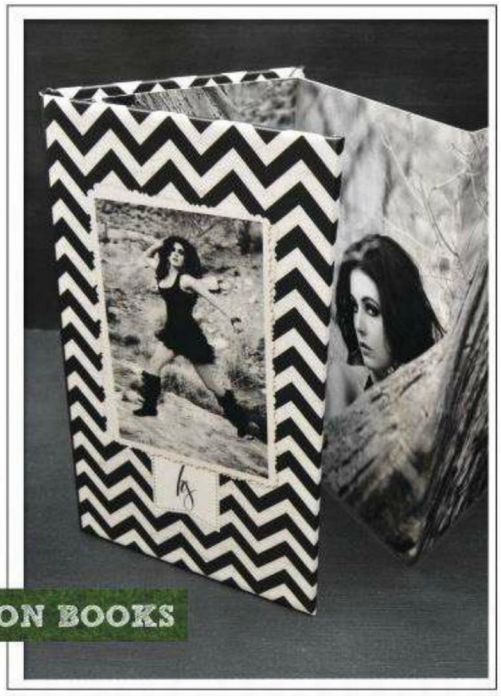

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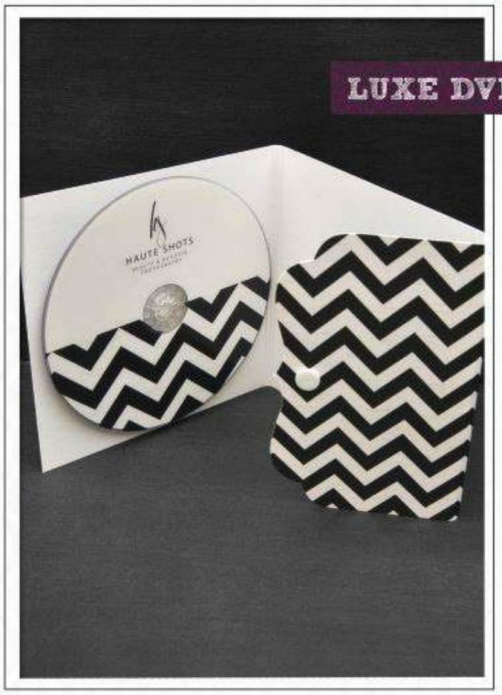

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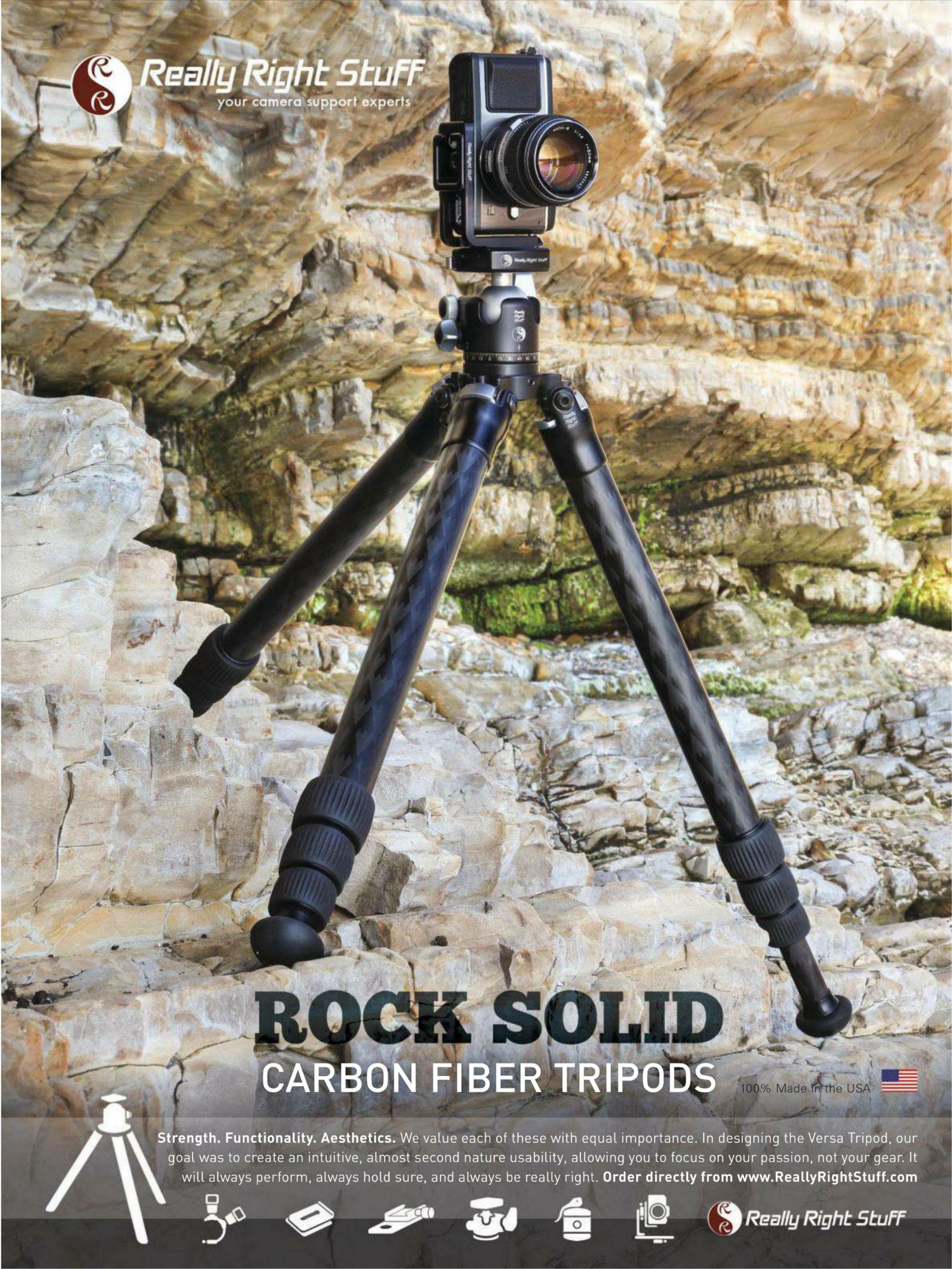
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HOW

EXPERT TIPS AND TECHNIQUES FOR BETTER PHOTOS

MANAGE THE CHALLENGES OF HIGH-CONTRAST SCENES

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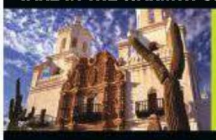
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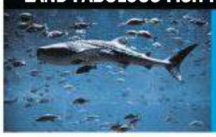
50

44

CREATIVE THINKING

IN THE MOMENT

Good photos come to those who wait—and watch

KEVIN MEREDITH

HENRI CARTIER-BRESSON popularized the "decisive moment," and his style of 35mm candid photography owes a lot to anticipation and timing, not to mention a dab of good luck.

Using a Contax T2 with Agfa Ultra 100, Meredith captured the glow of early morning light.

Fortune certainly paid a visit to photographer Kevin Meredith one cold day in May a few years ago at Brighton Beach in England. As he prepared to go for a swim with some of his close friends, this implacable shooter (lomokev.com) sensed a

quiet moment coming together.

It was 7:30 in the morning, and the warm sunlight contrasted sharply with the cold water. "Brighton Beach has a steep drop-off, and you can get knocked over by its waves," Meredith says. "My intrepid friends stood in a line waiting, and, when a gap appeared between the waves, they all stepped into the surf together."

As a large wave formed and began to approach, he raised his old Contax T2 compact film camera to his eye, anticipating the subtle tentativeness just before his friends dove in. "Sue was facing the same direction as the boys, and I was waiting to get the three figures looking out to sea," Meredith says.

As luck would have it, he didn't catch the moment he had prepared for. And because you can't chimp film (he was using Agfa Ultra 100), Meredith didn't know he'd missed his shot until the resulting prints returned from his photo lab.

"It's one of those fluke images," he says. "As I began to press the shutter button, Sue got cold feet (literally) and turned as if to say, 'Oh, blimey, I'm not getting into *that*!'"

For Meredith, the photo comes together in his subjects' seemingly choreographed body language, from the cold arms and clenched fist on the left side to the reassuring hand on the hip and the twist of the body on the right.

Meredith now ranks this photograph as one of his all-time favorites, although he admits it's a "photographer's photo." (Maybe that's why we liked it so much.)

His friends? They were less impressed. "They're like, 'Well, you can't even see my face!'" he laughs. *—Laurence Chen*

FIX IT FAST

B+W Fix

Lightening up a conversion

Maryanne Gobble used a 17–35mm f/2.8 Tamron XR Di lens on her Canon EOS Rebel XSi camera for this backyard moment. Exposure was 1/80 sec at f/8, ISO 400.

MARYANNE GOBBLE

THIS ONE brought back memories of the days of tweaking prints in the darkroom. A black-and-white enthusiast (see neweyedea.com), Maryanne Gobble made a monochrome conversion of this image of a praying mantis perched like Jiminy Cricket on her son's shoulder. We thought it was a little too dark and contrasty, making the boy's skin tone appear muddy. But we wanted to maintain the spirit of her version.

From her RAW file, we did a b&w conversion with Nik Silver Efex Pro 2, then, as Gobble had, we darkened the background (using Nik's control points). Then we softened overall contrast and lightened skin tones. Finally, we used Photoshop CS6's Curves and Smart Sharpen for contrast in the bug. Total fix time: 20 minutes.

—Dan Richards and Debbie Grossman

PHOTO GLOSSARY **BLOOMING**

WHEN THE ELECTRONS in a digital sensor's pixel site are exposed to large numbers of photons, they can overflow and contaminate adjacent pixel wells, resulting in flared halos around bright areas in your image. This is called blooming, and it compromises contrast and apparent sharpness in picture areas where darkness and highlights abut each other. One way to minimize blooming is by adjusting Hue, Saturation, and Luminance levels in image editing. The technique can be applied to all or individual color channels, and, among other uses, is particularly effective for sharpening up flower petals. To avoid blooming, think twice about including light sources in your frame. If you must, compose so they're not near areas of important detail.

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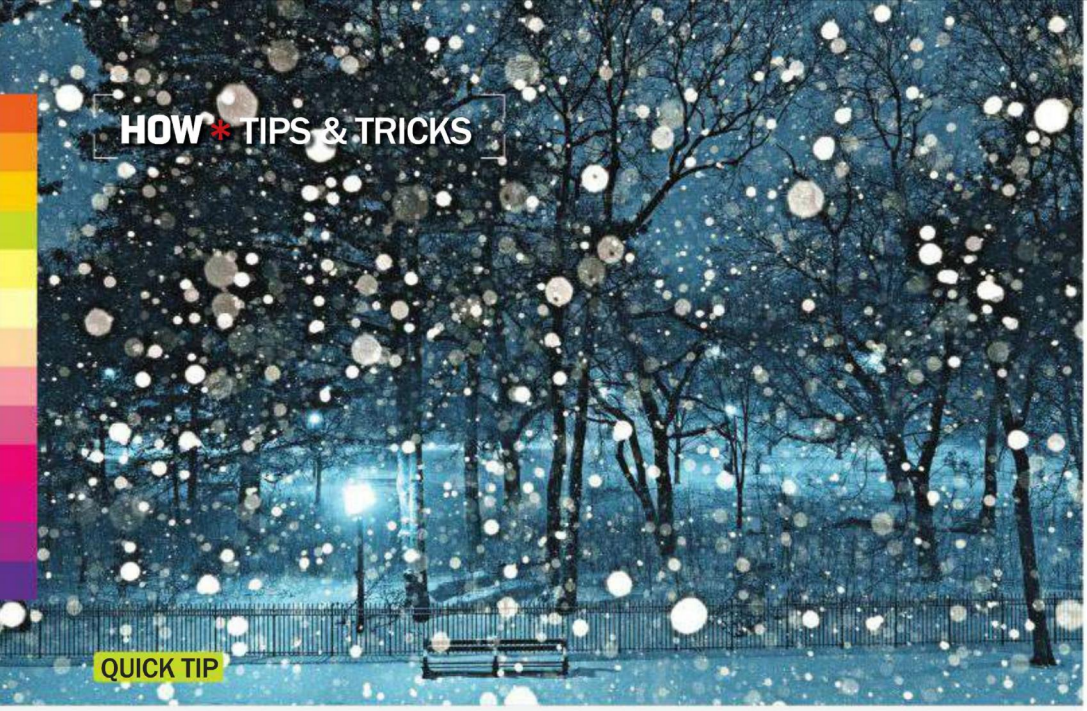


QUICK TIP

SPOT ON

In shooting snow, watch your settings

VINCENT SOYEZ, a commercial portrait photographer based in Brooklyn, NY, is always shooting. (See his work at vincentsoyez.com.)

"I constantly keep my eyes open for interesting visuals. In fact, if I don't shoot regularly, I start to feel that something is missing almost on a physical level," he says. "The photo shown here is a view from one of my windows. I felt seduced by the calm of the moment, and had to grab my Leica X1."

What makes this shot special is its exposure. By setting it manually, Soyez was able to expose for plenty of atmospheric background detail while letting the camera's flash exposure system make sure the defocused snowflakes weren't completely blown out.

If you find yourself in a similar situation this winter, don't give in to the impulse to shoot in your camera's "green" or auto mode. The AE system will almost certainly be fooled into thinking the scene is well-lit because of the bright white snowflakes in the foreground, and underexpose the scene in the distance. *—Peter Kolonia*

VINCENT SOYEZ

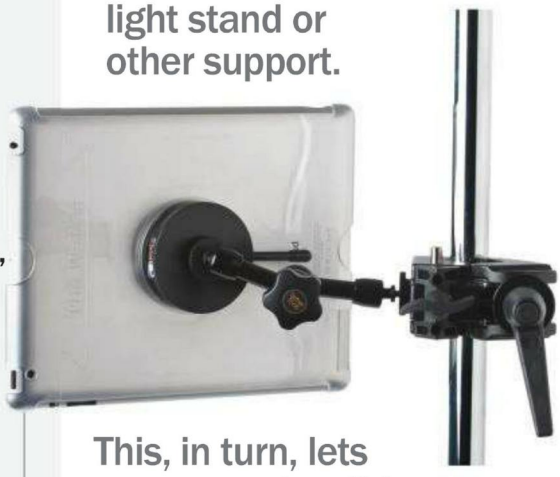
Using his Leica X1's manual exposure and auto flash modes, Soyez exposed for 1/4 sec at f/7.1, ISO 1600. To stabilize the camera, he planted his elbows firmly on the window sill.

What's This?

iPad Mount

▶ **What it is:** Tether Tools' Wallee Connect Lite Mounting System ($185, direct, for case, adapter, arm, and clamp).

▶ **What it does:** Allows you to mount an Apple iPad or Samsung Galaxy tablet to a studio light stand or other support.



This, in turn, lets you present a slide show, or, shooting tethered, share pictures with portrait subjects in real time. You can also use the mounted iPad to control some studio lights and camera settings remotely.

▶ **Other perks:** Wallee accessories include a carrying case ($40), kickstand prop ($25), and a headrest mount ($40) for attaching an iPad to a car seat.

30-SECOND SOFTWARE

DISTORTION FIX

In Adobe Photoshop CS6, there's an easy way to trim your image and fix perspective distortion at the same time. Click and hold the Crop tool in the toolbar so you can see its nested items, then choose the Perspective Crop tool (its icon looks like a small grid). Use it to make a selection around your image, then drag the corners of the tool to line up the grid with the straight lines in the building or object you want to straighten. Hit enter and Photoshop will trim your newly distortion-free image; suddenly it may look like you shot with a view camera instead of an SLR. Note that unlike with the new Crop tool, you'll lose the pixels when you trim them out, so don't forget to save your file as a new document. *—Debbie Grossman*

DEBBIE GROSSMAN

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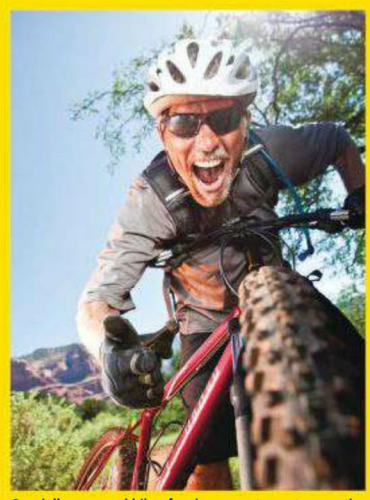
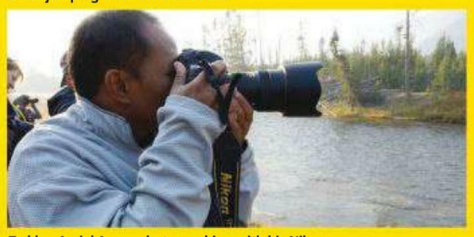
A LOOK BACK AT OUR VIDEO ADVENTURE

Mentor Lucas Gilman highlighting the video options on the Nikon D800



Specially arranged biker for the group to capture motion.

Mentor Reed Hoffmann pointing out "how to" capture the mountain biker jumping over the trail rocks.



Trekker Amiel Ansus photographing with his Nikon camera.

When we asked South Lake Tahoe (September 7-9, 2012) Mentor Series trekkers what they thought of the trip, they said "absolutely awesome," "a perfect trek for intense creativity and "a total immersion course in visual expression wrapped in a seamlessly organized, carefree, photographic adventure." Trekkers also had high praise for the Nikon Mentors, acclaimed photographer and educator Reed Hoffmann and well-known still photographer and adventure videographer Lucas Gilman. "The mentors were extremely knowledgeable, very friendly, and always available to offer great camera advice and video tips no matter what time of day or night." Even those participants who were initially skeptical about shooting their own broadcast-quality HD videos of mountain bikers with Nikon's latest HD-SLRs, which were available for the everyone to use, were soon won over. "Learning how to shoot extreme action video on a Nikon D4 was a blast, and it was really thrilling to see our group's video clips edited into a cool recap video with our names listed in the credits!"

From breathtaking sunrise views to a dinner cruise on Lake Tahoe, the workshop offered trekkers a wealth of priceless opportunities to shoot everything from scenic landscapes to artistic abstractions, kayakers modeling at sunset overlooking the lake, panoramic views atop the fabled Heavenly Mountain, and more. Throughout the weekend participants also had the chance to learn about video production workflow allowing them to understand the steps to creating their own videos. At the conclusion of this intense burst of creativity was a digital review session, where the mentors provided individual feedback to help everyone take their photography to the next level. As one trekker succinctly put it, "During that final slideshow, as we shared our images and video clips with our new friends, I realized that we not only learned an immense amount in a very short time, but also created images that we will treasure forever."

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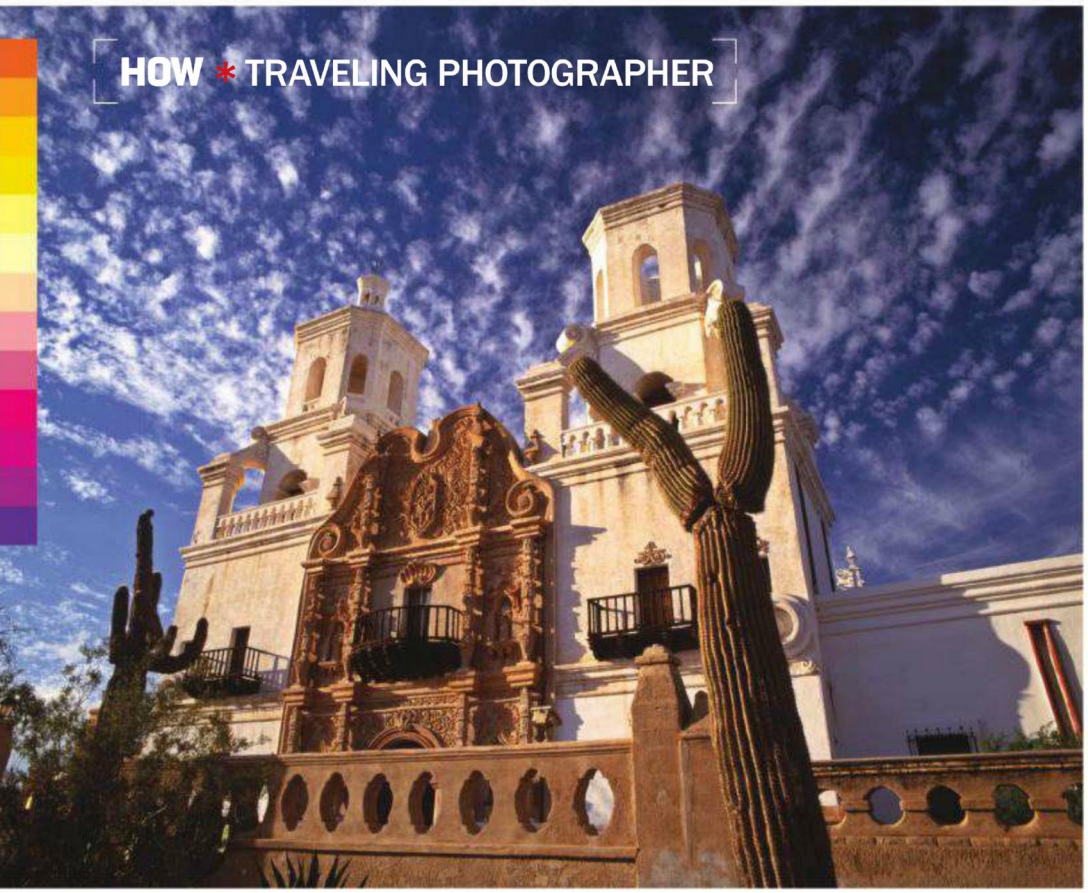

KERRICK JAMES

Desert City

Tucson is loaded with landscapes and lore

"TUCSON IS one of my favorite Southwest cities to photograph," says Mesa, AZ–based travel and adventure shooter Kerrick James. This city and its environs, he says, offers an inspiring mix of Old Mexico and Old West cultures, superb landscape and nature scenes, as well as a great vintage aviation museum and several of the region's best-preserved mission churches.

Framed by five mountain ranges and set in the vast Sonoran Desert, Tucson beckons with bold beauty and an out-of-time sense of history. It's torch-hot in summer (the city boasts 350 sunny days a year), but winters are warm (by day) and inviting.

In a recent conversation, James shared his favorite Tucson subjects to photograph:

Saguaro National Park, divided into two parts (one east of the city and one west), is the prime spot to photograph these giant cacti. "The western section is far more accessible," says James. He suggests exploring in the early afternoon and then returning for late-afternoon lighting and colorful sunset skies. Keep an eye peeled for ancient petroglyphs.

The Barrio Historico District drips with local ambiance and features richly painted 250-year-old adobe homes. "This is a wonderful area for details and color studies," says James. Themed murals and old cactus plantings are bonuses.

Mission San Xavier del Bac is widely regarded as the best example of Spanish Mission architecture in the region. "The whitewashed facade glows in sunrise and sunset light," he says, "but don't miss the newly restored interior, with gilt carvings and paintings mingling both European and Southwestern motifs." Light levels inside are low and tripods are allowed, but, he cautions, this is an active church.

The Pima Air & Space Museum boasts acres of visually awesome and unique aircraft from the X-15 test planes to the SR-71.

Also fun: Head an hour south to Tombstone for the OK Corral show, which concludes in a reenactment of the famous gun battle. And don't miss the Boot Hill graveyard. *—Jeff Wignall*

Founded in 1692, the San Xavier del Bac mission church is a popular Tucson destination for photographers, tourists, and pilgrims alike. Kerrick James shot it with a tripod-mounted Pentax 67 II and 55–100mm zoom on Fujichrome Velvia 50.

Under the Tucson Sun

More stops for your shot list:

● **ARIZONA–SONORA DESERT MUSEUM 2021 North Kinney Rd.** A desert microcosm with zoo and botanical gardens; some 300 animals and 1,200 plants in realistic settings. In Jan./Feb. open 8:30 a.m. to 5 p.m.

● **BIOSPHERE 2 Biosphere Road at Mile Post 96.5 on Oracle Road (Highway 77)** Planet Earth under a rambling series of glass domes overflowing with ecological science projects, run by the University of Arizona. Tours daily, 9 a.m. to 4 p.m.

● **CENTER FOR CREATIVE PHOTOGRAPHY University of Arizona, 1030 North Olive Rd.** Premiere showcase, with 90,000 works by 2,000 photog-raphers. Ansel Adams was a founder.

● **GATES PASS SCENIC ROAD Tucson's Speedway Blvd. becomes Gates Pass west of town** The local "wow" road—spectacular sunset views, dense with saguaro.

● **KITT PEAK NATIONAL OBSERVATORY 90 minutes from central Tuscon** The world's largest collection of optical telescopes and maybe the best night sky on the continent. Open daily, except major holidays, 9 a.m. to 4 p.m.; nightly observation programs.

● **SABINO CANYON 5900 N. Sabino Canyon Rd.** A pretty, oasis-like canyon just north of town. No cars: Hop on/off a tram at any of nine stops along the 3.8-mile road.

● **TUBAC An hour south of Tuscon** Touristy but fun arts colony; the first European settlement in Arizona.

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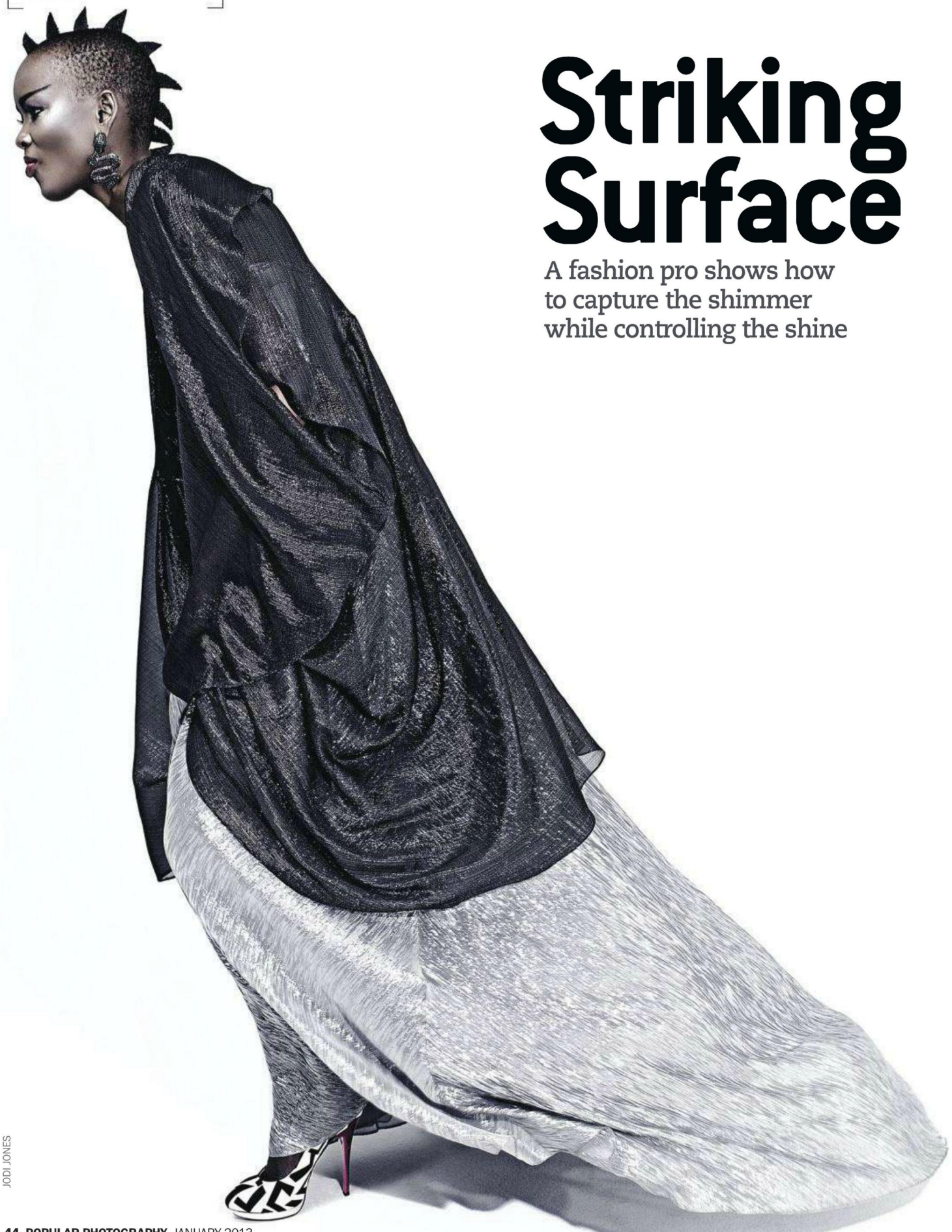


JODI JONES

LIGHTING FOR CONTRAST

SIMPLE ▲ COMPLEX

THE BEST studio photography starts with a strong concept. For Jodi Jones, a well-known New York fashion and advertising photographer (jonesimage.com), this image made for the online magazine *Zink* was all about contrast. "There's hard and soft, black and white," she says, "and the angularity of the model's features that contrasts so strikingly with the soft, flowing movement of the clothing."

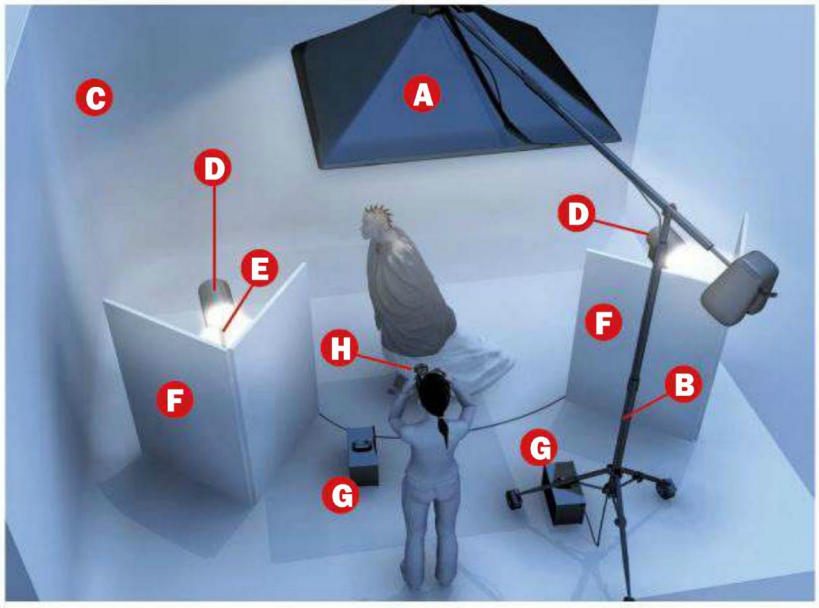
To create this study in contrast, Jones turned to a diverse arsenal of lighting tools and techniques.

First, she wanted a bright white background that was evenly lit from edge to edge. "If I had aimed my background lights directly at the backdrop [a cyclorama], it would have produced hot spots," she says. "To avoid that, I aimed the lights into two V-flats on either side of the set. It created a broad, even source free of pronounced highlights."

But she also had to keep that bright background light off her subject. "I lit the model separately from the background, trying not to allow any spill from the two side lights to reach her," says Jones. "In shots like this, if any of the background light spills onto the subject, it can dilute the effect of your main light."

Her single, highly directional main light, above the model, produced shimmering highlights in the silvery fabric. If background lights had struck the model, the silvery highlights would have had less impact. That single top light also added dimension and an important floating quality to the image.

Jodi Jones gives a shout-out to the hair styling. The spikes? They're green kitchen scrub pads that the hairsylist Takahide cut into triangles, spraypainted black, and glued to the model's head. "I'm glad our model Flaviana was game for it, because I think this last-minute adjustment makes the shot," says Jones. Exposure: 1/125 sec at f/11, ISO 100.



KRIS HOLLAND/MAFIC STUDIOS (ILLUSTRATION)

For this edgy portrait of Tanzanian model Flaviana Matata (Next Models), New York–based fashion pro Jodi Jones chose as her main light a Broncolor Pulso G 1600 strobe head mounted in a 60x60-inch Broncolor Pulsoflex C softbox (A). She set the softbox on a Manfrotto 085BS Heavy Duty Black Light Boom and Stand (B). Jones lit the backdrop, a 20x30-foot cyclorama (C), with two Pulso G heads (D) mounted on 9-foot Manfrotto Alu Ranker light stands (E) and bounced into V-flat reflectors made of 1/2-inch white foamcore board (F). She powered both the main and background lights with Broncolor Scoro S 1600 powerpacks (G) and shot with a Hasselblad H4D-40 digital camera and a 50mm f/3.5 HC II Hasselblad lens (H), firing the strobes with a camera-mounted Broncolor RFS 2 radio slave transmitter. "Although I love to shoot with these amazing tools whenever possible, I work with very basic equipment too. Lack of high-end gear shouldn't hold any photographer back from attempting a similar project," says Jones.

THE GEAR

Broncolor Pulso G 1600 strobe (replaced by the G2)

Broncolor Scoro S 1600 power pack (now, S2A)

Broncolor Pulsoflex C softbox **($837, street)**

"Using one foreground light also helps create a singular focus," the photographer says. "I like to simplify lighting when the image is mainly about the model or clothing, and not so much about the model in a striking location. I don't want to complicate things with unnecessary highlights and shadows that can confuse the viewer as to what to focus on. Sometimes less is more."

Other elements contributing to the impact of this photograph:

- **MOVEMENT** By asking her model to walk across the set instead of posing, Jones gave billowing life to the glamorous gown.
- **THE BACKGROUND** Shooting against an evenly lit cyclorama gave Jones the ability to move with the model and slightly change the camera's position between shots more easily than she could have using a roll of white seamless. *—Peter Kolonia*

SIMPLE COMPLEX

Fixes on the Go

Use your tablet to edit anywhere

AS A serious photographer, you'd never consider doing major photo editing on your tablet—or would you? While we still edit our most important shots on a computer with a calibrated display, for sharing snapshots and images quickly, our fondness for tablet-based editing is growing.

Both the Snapseed app, from Nik ($4.99 for Apple's iOS; likely to come soon for Google's Android, since Google bought the company) and Perfectly Clear 3, from Athentech ($2.99 for iOS; $1.99 for Android) allow you to do high-quality edits quickly. Snapseed excels at creative filters and targeted adjustments for bigger files, while Perfectly Clear is aces for photos snapped with a phone or tablet. Both make good use of touch gestures and offer the added bonus of allowing you to edit from the couch, the plane on your way home from vacation, or wherever you happen to be.

Tweaking your photos with Snapseed or Perfectly Clear on an iPad is a world away from doing so on a computer.

There are limitations, of course. Getting images shot onto your tablet without using Wi-Fi can be a pain. And, especially with Perfectly Clear, file size limitations prevent you from outputting high-resolution images (Snapseed tops out at 20.25MP if you have the latest iPad, and can even edit RAW files). Here are some cool ways you can use both these inexpensive tools on an iPad.

—Debbie Grossman

DEBBIE GROSSMAN

WORKING WITH SNAPSEED

Make targeted adjustments

Nik software is known for its control points—when you add a dot to your image, it automatically creates a mask to target the area you want to affect. In Snapseed, tap Selective Adjust to start. Select the radius of your area by using the pinch gesture. The software shows your mask in the form of a red overlay as you resize the radius. **When the mask is set, tap and drag up or down to choose to adjust Brightness, Contrast, or Saturation.** Then drag left or right to decrease or increase the effect. Make one control point to darken and add saturation to the sky, and add another one to increase contrast and saturation in the ground. Then duplicate that control point three times to add the effect to the whole bottom part of the image. Hit Apply to accept the changes.

Go black-and-white

Nik makes the b&w plug-in Silver Efex Pro, so it has plenty of monochrome know-how in its pocket. Snapseed is a much less expensive way to get access to it. **When going grayscale, begin by tapping on the Presets button to see some options for starting points.** Select the Film preset to use one that has grain already added in. As in the Selective Adjust tool, swipe up or down to choose to adjust Brightness, Contrast, or Grain, and swipe left or right to decrease or increase the strength of each.

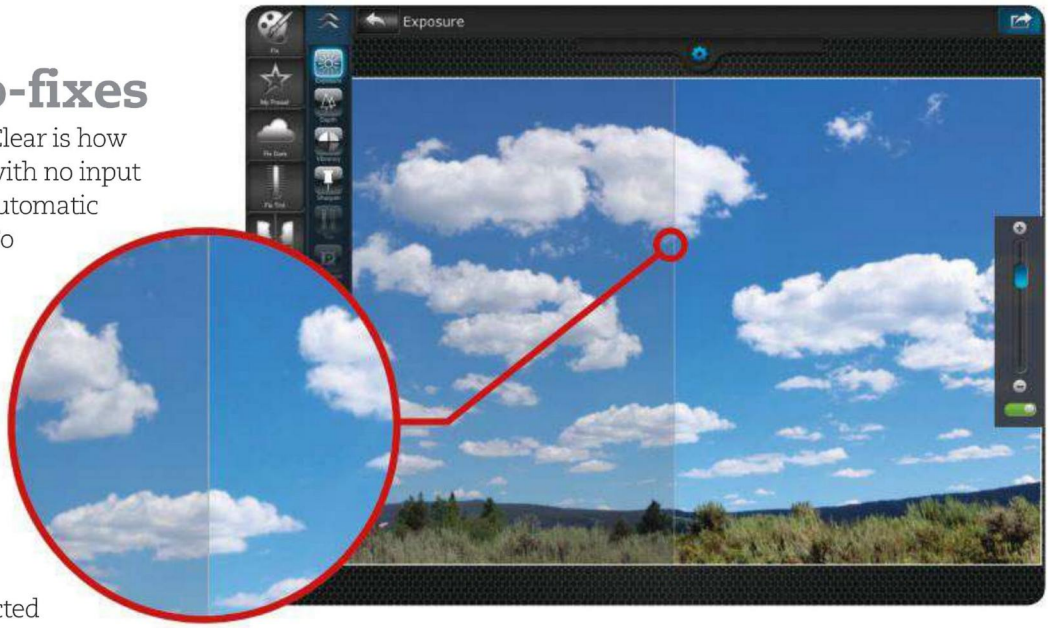
Add tone or texture

Here's where the boundaries of your taste come into play. It's easy to go overboard when with a few simple swipes you can make your picture look like a moldy, selenium-toned tilt-shift. For more subtlety, tap on Center Focus and decrease edge brightness to add a slight vignette. **Choose Vintage and pick a Style preset with a color tone you like, then dial down the Texture Strength to zero. Reduce the style strength, too—enough so that it's just adding a subtle tint.** Then decrease the Brightness to add a bit more drama.

USING PERFECTLY CLEAR

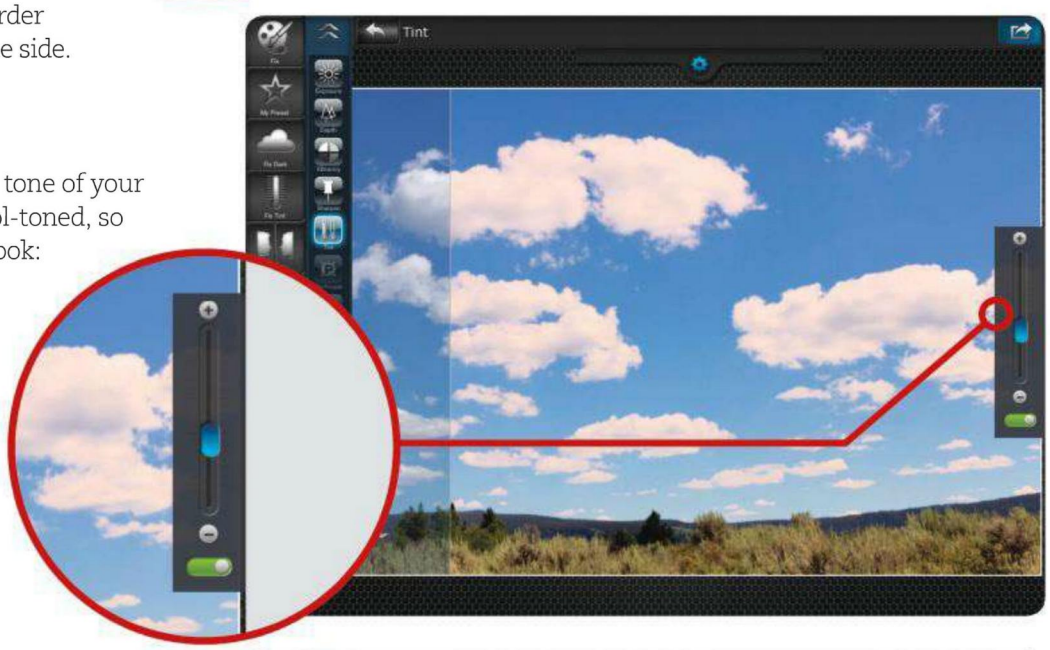
Assess the auto-fixes

One of the strengths of Perfectly Clear is how quickly it can improve an image with no input from you. With this picture, the automatic fixes added vibrancy and depth. To see exactly what the app did, tap to bring down the toolbar next to the Fix icon in the top left, and adjust its fixes accordingly. The ones that aren't grayed out are those that are switched on. **The automatic exposure correction didn't brighten the sky enough, so use the slider to increase it slightly.** You can choose how much of the uncorrected image to show by dragging the border between "before" and "after" to one side.



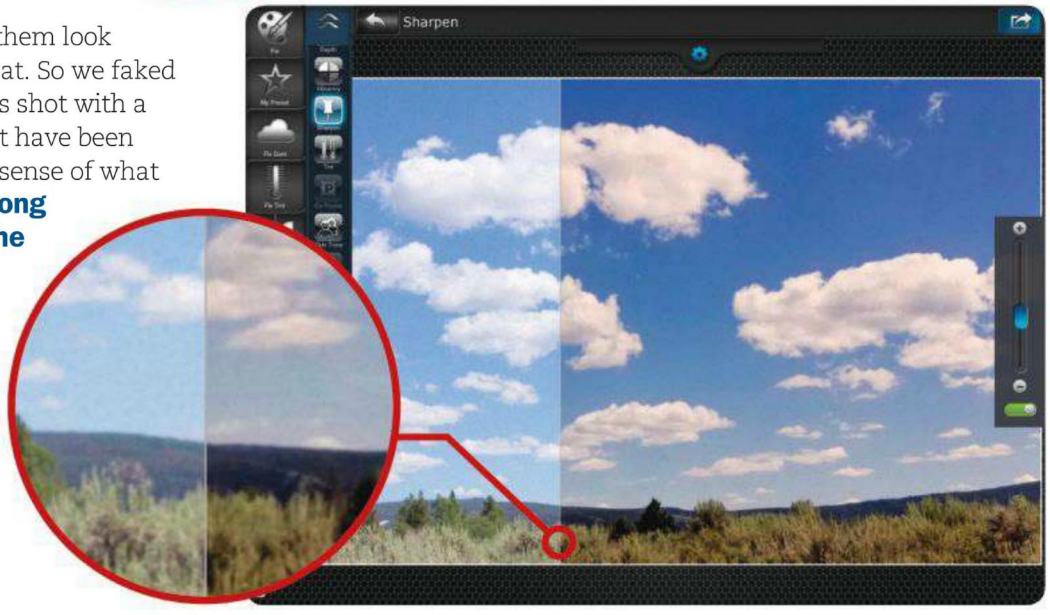
Adjust color

Tap the tint button to change the tone of your image. This photo seems very cool-toned, so warm it up for more of a sunset look: **Tap the slider and drag up to increase it, but beware of adding too much rosiness to the clouds.** Toggle the on/off switch at the bottom of the slider to see your image with and without the effect.



Fix Noise

Another thing Perfectly Clear does quite well is to take noisy cameraphone images and make them look decent—and sometimes even great. So we faked a version of this photo, which was shot with a DSLR, to make it look like it might have been taken with a phone to give you a sense of what the app can do. **Scroll down among the fixes to Noise, and, as in the other tools, use the slider to add more noise reduction.** Our fake noise is so bad that you need to crank up this tool to make it work. To correct the softness you added reducing the noise, go back to the Sharpen tool and turn it up, too.



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See Life

Try Kyle Ford's tips for great pictures in public aquariums

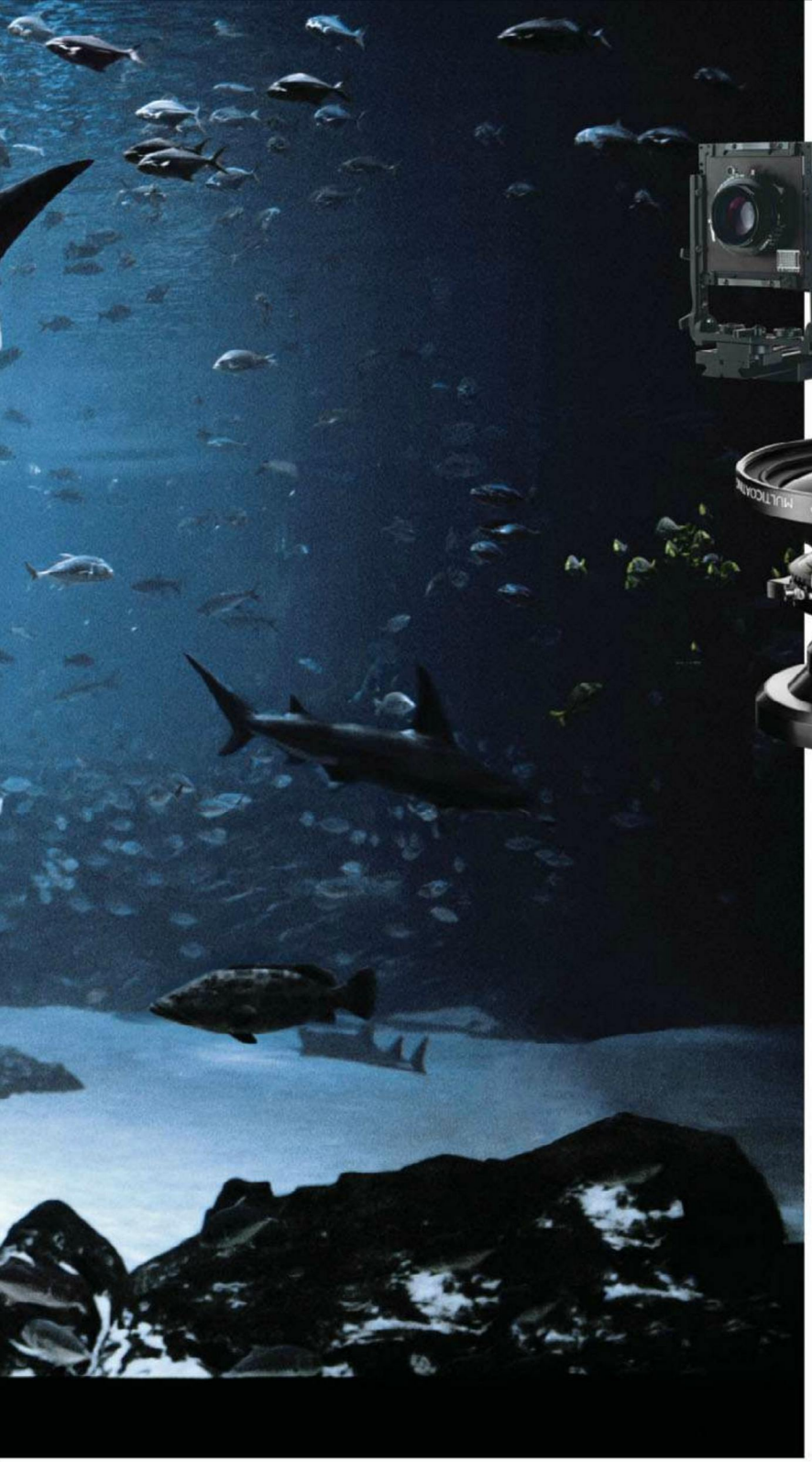
KYLE FORD, KYLEFORDPHOTOGRAPHY.COM

SHOOTING IN a massive public aquarium may be your only opportunity to net a sea creature as magnificent as Kyle Ford's whale shark, above. The project will be fun, if fraught with challenges.

The good news? Ford, a fine-art shooter and photography professor at Skidmore College in Saratoga Springs, NY, has catalogued a set of techniques that makes shooting in large aquariums doable. Here we offer a handful of his best.

The images that comprise this composite were all exposed for 1/60 sec at f/6.8 on Kodak Portra 400, metered at ISO 200.

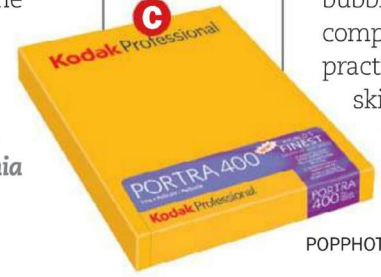
- **ARRIVE EARLY**—as soon as the aquarium opens—to avoid crowds. And if you have the choice, stick with aquariums that permit the use of tripods.
- **AVOID DISTORTION** by placing your camera parallel to the glass wall of the tank.
- **TURN OFF ON-CAMERA FLASH** to prevent distracting reflections.
- **FOCUS ON NEARBY CREATURES.** The more water between your camera and your subject, the softer the focus will be.
- **INCLUDE HUMAN SILHOUETTES.** They'll inject an important sense



Because he typically makes large 50x60-inch prints, for this image Ford used a Canham 4x5 DLC field camera (A) and Schneider 90mm f/5.6 Super Angulon lens (B) (a 28mm equivalent in the 35mm format). His film was 4x5-inch Kodak Portra 400 (C).

of scale and dimension.

- **CONCENTRATE ON LIGHT, SIL-VERY FISH** rather than darker species, which can blend into backgrounds.
- **USE A HIGH-SPEED LENS** so you can set fast, action-stopping shutter speeds. Slow-swimming fish are easier to capture sharply than darters.
- **CONSIDER COMBINING IMAGES WITH SOFTWARE,** as Ford did for the image shown here. Because it's hard to catch multiple species attractively in a single shot, he made separate photos of the fish in this tank. He combined them in Adobe Photoshop later using layers and masks. *—Peter Kolonia*



Step 1

Scout the aquarium. The day before you shoot, visit the aquarium and decide which scenes to capture. Determine where to set your tripod and what equipment to bring. Gauge visitor traffic and determine the best shooting times.

Step 2

Set up your rig. On the day of your shoot, set up your DSLR and tripod. Focus, then check it by zooming into a test image on the LCD. When the scene is adequately sharp, lock focus by switching to Manual Focus. Make sure the MF ring doesn't shift as you shoot.

Step 3

Meter and set exposure. Ford recommends spot-metering the darkest subject area for which you want detail and then closing down two stops. Shoot in RAW at the lowest ISO that will allow a shutter speed no slower than 1/60 sec. If you intend to combine images, use identical exposures for each.

Step 4

Get their best sides. Shoot when the fish are close to the glass and their body language is colorful and indicative of the species. "It's a bit like hunting," says Ford. "I wait for a series of decisive moments. It took three hours to make the 10 images that I combined for this shot."

Final Step

Fine-tune in post. Adjust sharpness, contrast, and color balance, and clean up debris and bubbles. Making a realistic-looking composite image takes a lot of practice and patience to build your skills. "It's a meticulous process that actually feels a lot like painting," says Ford.

Top British Photographer

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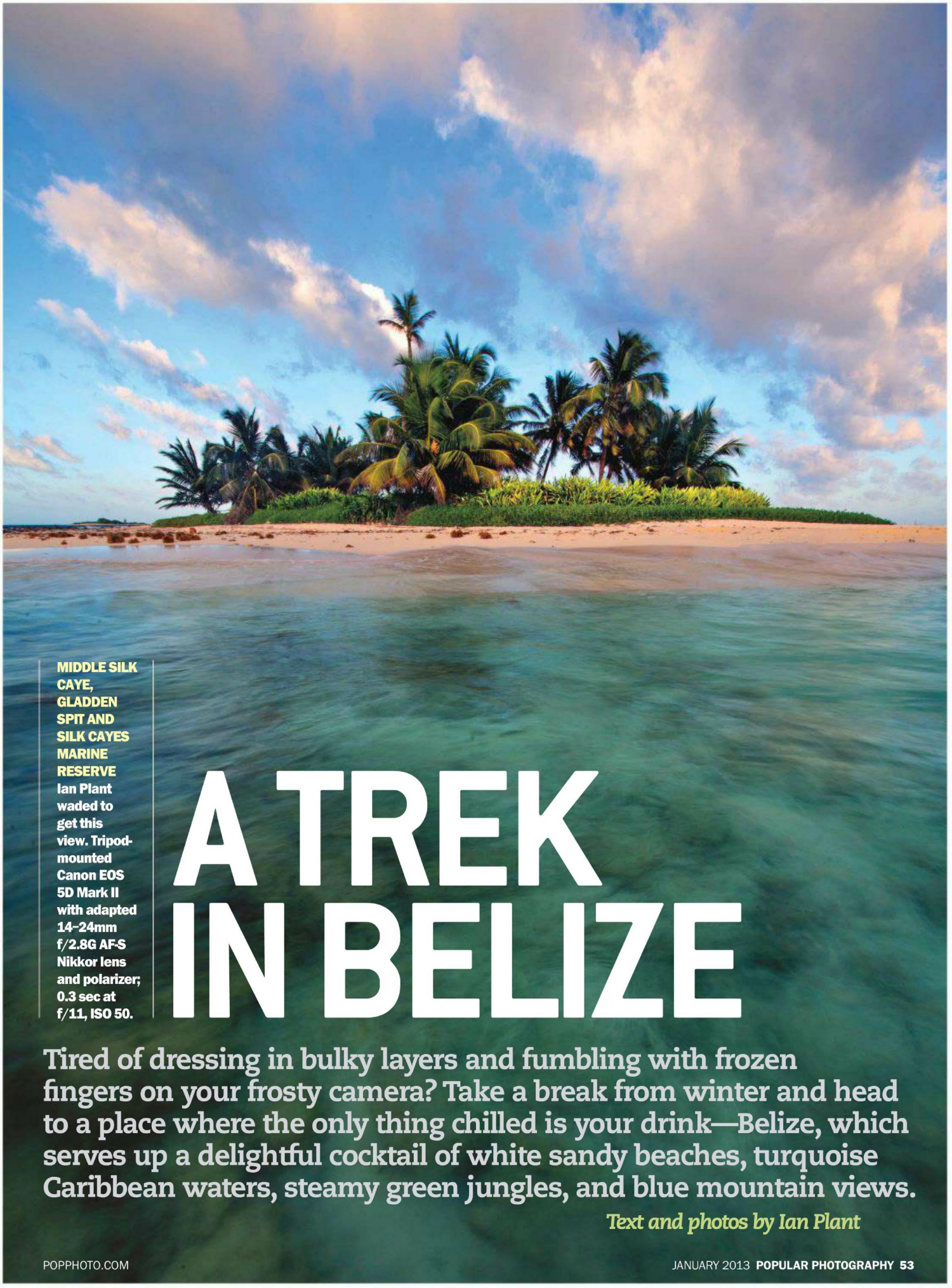


MIDDLE SILK CAYE, GLADDEN SPIT AND SILK CAYES MARINE RESERVE Ian Plant waded to get this view. Tripod-mounted Canon EOS 5D Mark II with adapted 14–24mm f/2.8G AF-S Nikkor lens and polarizer; 0.3 sec at f/11, ISO 50.

A TREK IN BELIZE

Tired of dressing in bulky layers and fumbling with frozen fingers on your frosty camera? Take a break from winter and head to a place where the only thing chilled is your drink—Belize, which serves up a delightful cocktail of white sandy beaches, turquoise Caribbean waters, steamy green jungles, and blue mountain views.

Text and photos by Ian Plant

SEA TURTLE, CARIBBEAN Plant used a Canon PowerShot S100 in a Fisheye FIX underwater housing with a Fisheye FIX UWL-28 wide-angle lens adapter to capture this loggerhead sea turtle at 1/125 sec and f/4, ISO 200.

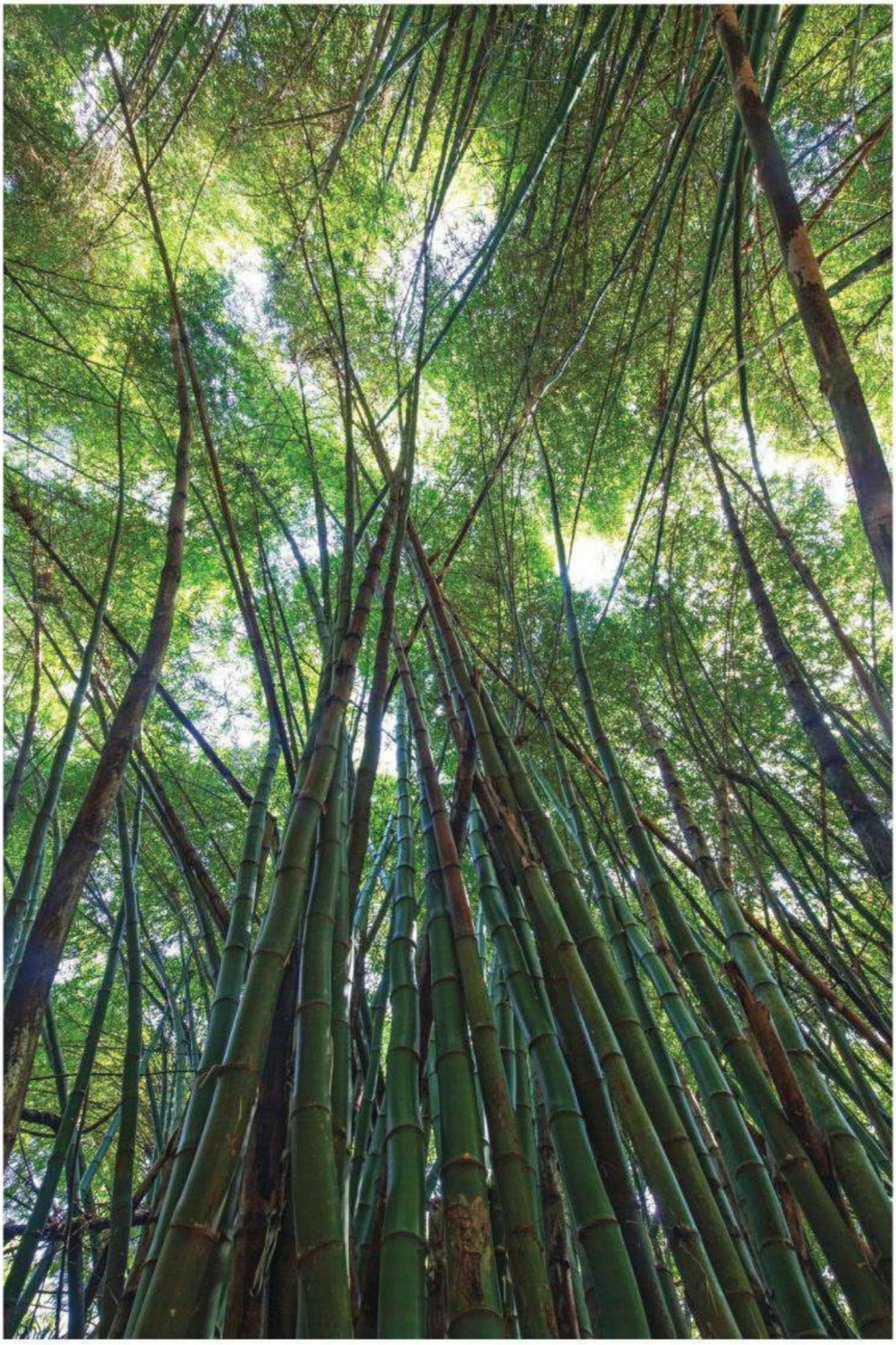
WITH MEXICO to its north and Guatemala to its south, Belize lies on the Caribbean coast of Central America. The potent combination of its warm winter climate, lush scenery, and compelling wildlife will thaw your creative juices. Just pack your swimsuit, a waterproof camera, and your sense of adventure for this photo trip of a lifetime. Here's how.

Go Coastal

Highly popular among sun-worshipping tourists, Belize's glittering sandy beaches are just as perfect for photo enthusiasts. Dangriga, Hopkins, and Placencia are wonderful tourist towns, and all three give you easy access to coastal scenery.

But to really experience the best that Belize has to offer, you will need to find a way out to the offshore barrier reef, the second largest in the world. Here you will find tiny deserted islands bedecked with only a few swaying palm trees. Underwater lies a beautiful reef teeming with life, including whale sharks (which peak in April and May), sea turtles, and plenty of other photogenic species.

Although a few islands have resorts on them, the best way to



BAMBOO GROVE, MONKEY RIVER JUNGLE
Plant aimed his tripod-mounted Canon EOS 5D Mark II with a 14–24mm f/2.8G AF-S Nikkor ED (mounted using an adapter) up into the jungle canopy. Exposure was 1/5 sec at f/2.8, ISO 100.

get to the barrier reef is by signing up for a snorkeling or diving tour, or by chartering a private boat (either can be easily arranged in one of the towns). The most photogenic islands are typically the ones farthest from the mainland, so talk in advance with your charter operator if you want to be on location for sunrise or sunset photography (you can also book an overnight camping excursion). A wide-angle zoom will come in handy for coastal scenery shots, especially for combining incoming waves with colorful sunset skies.

If you plan to do any snorkeling or diving, consider bringing along a waterproof camera or an underwater housing for your DSLR. Quality housings start at around $1,500; renting one is another possibility, although a rental for a two-week photo trip can cost almost as much as buying one. But don't rule out waterproofing your compact camera; I opted for a Canon PowerShot S100 in a Fisheye FIX underwater housing, which gave me RAW shooting and other options.

While the results with this rig were certainly more than adequate for my occasional underwater forays, nothing beats a DSLR for flexibility and speed of use in underwater work.

Take a Jaunt in the Jungle

Great photo opportunities can also be found in the interior jungle, such as the one near the Monkey River, outside the town of Placencia.

Belize boasts dozens of parks with trails that wind through various jungle environments. Jungles are visually chaotic, making coherent photos difficult, so simplify compositions by zooming in on intimate details such as backlit jungle palms. Or focus on the wildlife, such as the howler monkeys pictured on page 108.

Try a Cave Crawl

With hundreds of stunning cave complexes inside its porous limestone bedrock, Belize is a premier destination for spelunkers. But you don't need to be a professional caver to explore the best of Belize's underworld. Plenty of caves are easy to access on your own or on a guided tour.

Perhaps the most stunning example, and the easiest to get to, is Rio Frio Cave in the Mountain Pine Ridge Forest Reserve. This massive cathedral of stone is open at both ends, connected by a quarter mile of gurgling brook cleaving through the inky darkness. Be prepared for exposures of several minutes to

capture the faintly lit interior; a sturdy tripod is absolutely necessary to ensure sharp images.

For your own safety, don't forget to sign in at the military checkpoint near the cave; although rare, bandits from across the nearby Guatemalan border occasionally rob tourists in this area.

After photographing Rio Frio, stop at nearby Rio On Pools for some beautiful waterfall scenery. Other popular cave areas include Barton Creek and Caves Branch, which can be explored by canoe (note that you will have to do all your shooting from the boat), and Actun Tunichil Muknal cave, which is host to a number of Mayan artifacts and burial chambers.

Capture Animal Life

For wildlife viewing, Belize offers much more besides the barrier reef. One of the most popular places is Cockscomb Basin Jaguar Preserve in southern Belize, home to a number of wild cat species, including its namesake. Though Belize is home to five wild cat species, including jaguar, puma, ocelot, margay, and jaguarundi, sightings at the preserve are very rare. But you can expect to see a number of bird species.

IGUANA, MONKEY RIVER
Plant used his 100–400mm f/4.5–5.6L Canon EF IS telezoom on a Canon EOS 5D Mark II to capture this reptilian sunbather; 1/400 sec at f/5.6, ISO 400.

If you are looking to stretch your legs, hike up to Tiger Fern Hill for waterfalls and beautiful mountain views of jagged Victoria Peak, the second-highest mountain in Belize. Also consider a trip to the nearby small town of Red Bank to photograph scarlet macaws. Ask anyone in town and they will point you to the caretaker of the macaw preserve; for a small fee you can hike up to a viewing area. Check ahead of time to find out if the macaws are present; they are typically active here only from January through March.

Crooked Tree Wildlife Sanctuary (about 30 miles north of Belize City) is another popular wildlife viewing destination. Every year, migrating birds flock to the sanctuary's waterways by the thousands. The best months for photography are usually February to May: migrating birds are at their peak, and low dry-season water levels encourage birds into the open to seek food in the park's shallow lagoons. Belize has the largest nesting population of jabiru storks in all of Central America; in April and May, the birds that nest in the northern and central parts of Belize gather at Crooked Tree in large numbers.

To view and photograph shy species such as the jaguar, consider a visit to the Belize Zoo, about 30 miles west of Belize City. The zoo is populated primarily with orphaned and rescued animals; those unable to return to the wild become permanent residents. The zoo does its best to keep the enclosures natural in appearance, thus enhancing your photographic experience.

For shooting wildlife, bring some long glass. Lenses in the 400mm to 500mm range will help close in on distant birds, and image stabilization is a

CONTINUES ON PAGE 108

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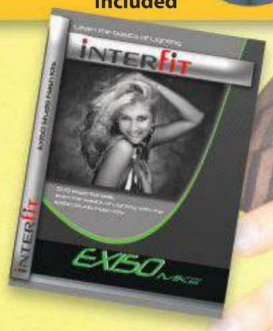

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1 x Translucent Umbrella
1 x 60cm (24") Softbox
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1 x Educational DVD

INT353 | 3 Head Kit | Lamp INT038 75 watt
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MODERN Maturity

Canon EOS 5D Mark III

It's the best low-light DSLR we have yet tested. A near-perfect tool for the still shooter, it can double as a top gun for the videographer. And while it's a new model, it's based on a time-tested workhorse for serious shooters, amateur and pro alike. It's the Canon EOS 5D Mark III, and as the camera "that best refined or redefined photography," it's our Camera of the Year for 2012.

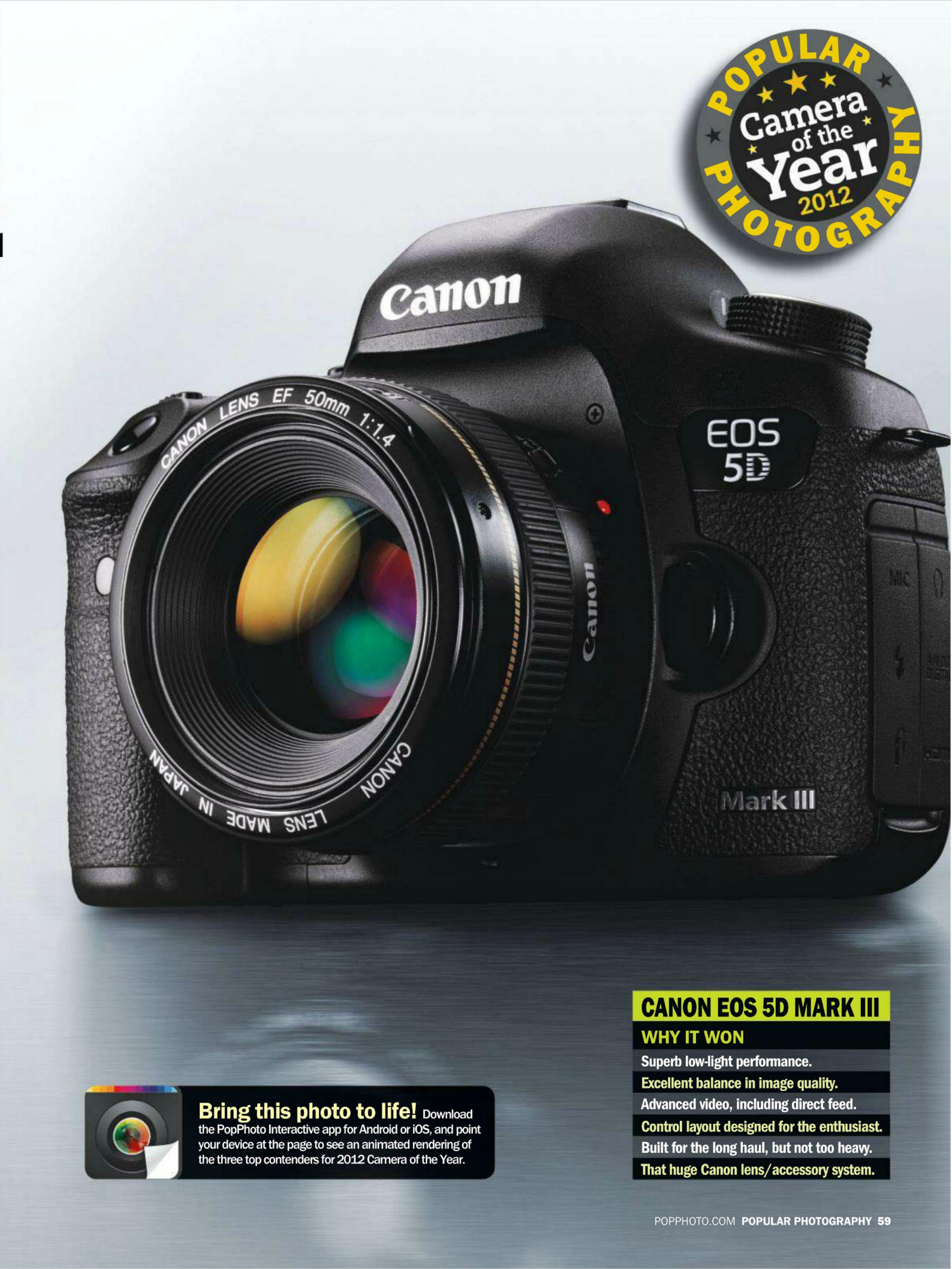
Text by Dan Richards; photos by Satoshi

2012 PROVED a truly great year for cameras. In the wake of 2011's devastating tsunami in Japan and flooding in Thailand, camera manufacturers released nearly two years' worth of terrific models in 2012, all within a span of eight months.

But our Camera of the Year choice came down to just three real finalists—the Canon EOS 5D Mark III, the Nikon D800, and the Sony Alpha 99. Significantly, these are all full-frame DSLR models. And the three share many other characteristics: They possess video capability far advanced from what we saw even a year ago, are backed up by massive lens and accessory systems, and, as expected, put up breathtaking image-quality numbers in the Popular Photography Test Lab. So this Year of the Full Framer might also be called the Revenge of the Legacy 35mm DSLR.

As a result, the decision by our panel of editors was one of the toughest in recent memory. But in the end, we came down squarely on the "refinement" side of our criteria.

Our testing had a lot to do with it. Canon's 22.3MP EOS 5D Mark III gained just 1.2MP over its predecessor, the still-current Mark II, but that was sufficient for overall Excellent image quality: resolution at 2750 lines per picture height, color accuracy at a Delta E of 6.9, and stellar noise suppression. To be sure, its resolution was not quite a home run among the finalists: The Sony A99 squeaked past it incrementally, and the Nikon D800 beat it by a country mile. But we felt strongly that the Canon produced the best balance across all imaging factors, with Low or better noise up to ISO 12,800, and still acceptable noise at ISO 25,600. And consider that at ISO 51,200, noise crept just barely into our Unacceptable range, which translates into a moderately grainy image that can be perfectly usable for applications such as photojournalism. (Those of us who remember souping Kodak T-Max P3200 in rocket fuel to get gritty-grainy



CANON EOS 5D MARK III

WHY IT WON

- Superb low-light performance.
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black-and-white at ISO 6400 are seriously amazed.)

Beyond that, Canon improved everything about the 5D in building the new Mark III: There's faster and more sensitive autofocus, a more logical control layout, addition of a Quick Menu, faster burst speeds (6 fps, up from 3.9 fps), dual card slots rather than a single, better ergonomics. Plus, a recently announced firmware update will allow the Mark III to feed uncompressed HD video to a recording device—breaking Nikon DSLRs' monopoly on this advanced capability.

Yes, the 5D Mark III should have a pop-up flash. For those of you who still sneer at our insistence on this "amateur" feature, we can only say, "wireless TTL flash control." Maybe Canon will see fit to add at least a built-in wireless trigger in the Mark III½.

Assessing the Runners-Up

If the 5D Mark III represents a triumph of refinement, the Nikon D800 is something like an engine swap of a smooth V6 for a snorting, supercharged V8. While not nitro-burning, the D800's 36.3MP sensor burns photographic rubber with a tested resolution of 3510 lines—the best result we've gotten yet from a DSLR. To put that in some perspective, that's triple the pixel count of the Nikon D700 (which stays in the line), and nearly double the linear resolution.

As our lab and field tests showed, though, this comes with some compromises. Noise is Low or better only to ISO 800, and Unacceptable at ISO 12,800. Humongous resolution begets humongous file sizes—some of the RAWs from the D800 were 65 megabytes, so think high-capacity memory cards, and a bunch of them. Burst rates top out at 4 fps, with a serious limit—16 frames—to the maximum RAW burst.

But if you're a photographer who craves resolution, the beautifully made, ergonomically fine D800 may be your ticket. We've already heard from a studio shooter who is mothballing his medium-format rig and Phase One back for a D800, for which he has existing lenses. Studio shooters, after all, don't need high ISOs.

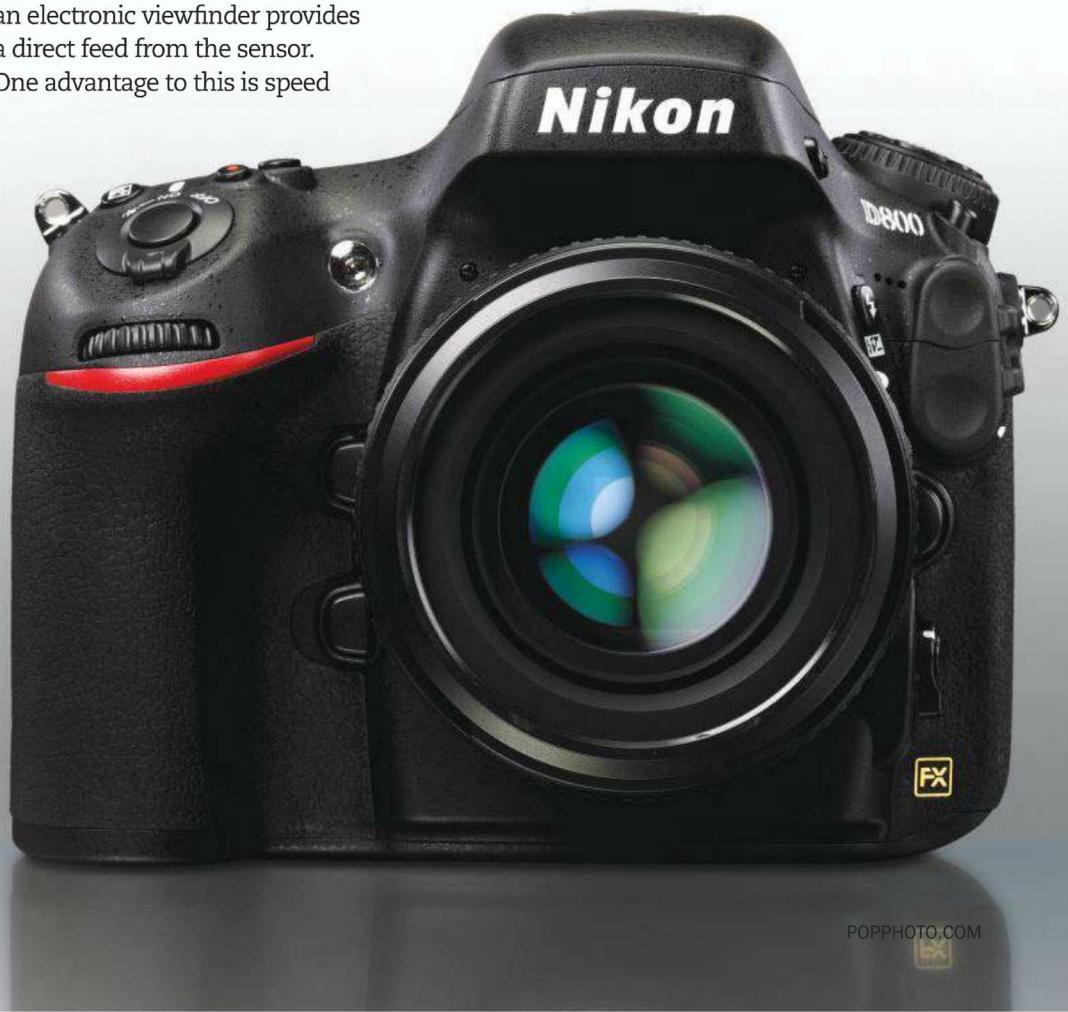
The watchword for the Sony A99 is innovation. This 24.3MP marvel wowed us with new technology in autofocusing, movie recording, high-speed shooting, and more. This model is the first full-frame DSLR to use Sony's transmissive-mirror technology, by which a stationary mirror diverts some light to metering and AF modules while an electronic viewfinder provides a direct feed from the sensor. One advantage to this is speed shooting—6 fps with metering and autofocus on all frames.

The Nikon D800 is firm evidence that the megapixel wars are far from over: Its 36.3MP sensor challenges some medium-format digital rigs' resolution.

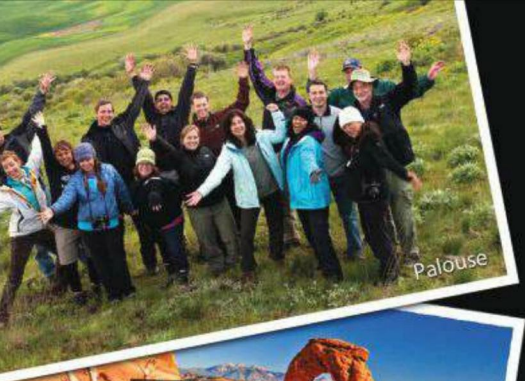
The A99 also adds phase-detection sensors to the imaging chip itself, allowing fast tracking AF in live view and video recording. Other innovations, borrowed from video camcorders: the user-adjustable focus-range limiter and focus peaking in manual mode, which highlights detail when it comes into focus. On the actual video front, the Multi-Interface Shoe atop the camera accepts accessories such as a pro-grade microphone kit with separate stereo-in jacks rather than a dinky single miniplug.

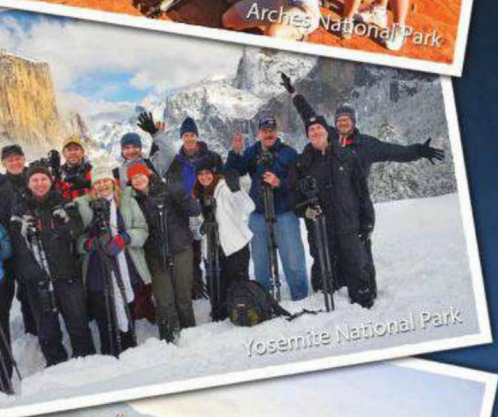
As our test results on page 82 reveal, the A99 puts up Excellent image quality numbers, bettering the Canon 5D's resolution by some 75 lines. Noise performance wasn't as good, though, and we might

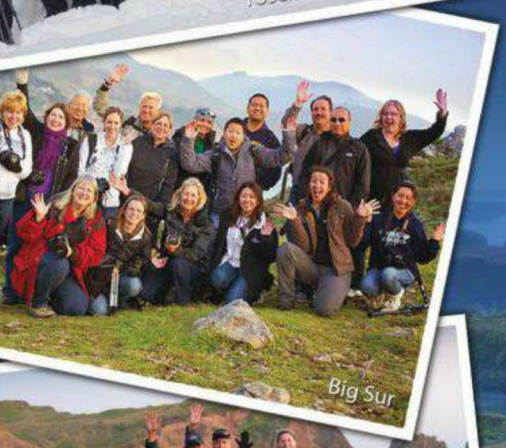
CONTINUES ON PAGE 110

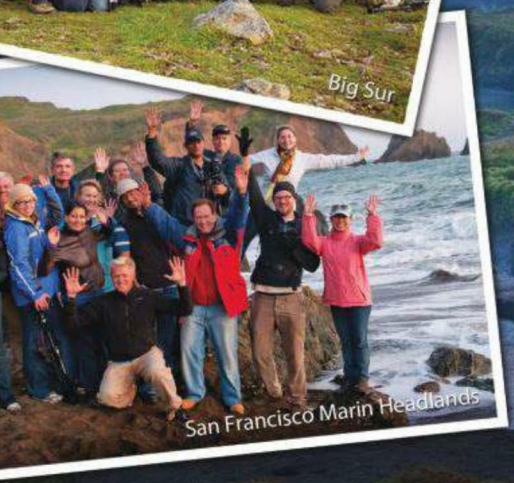


Nikon D800









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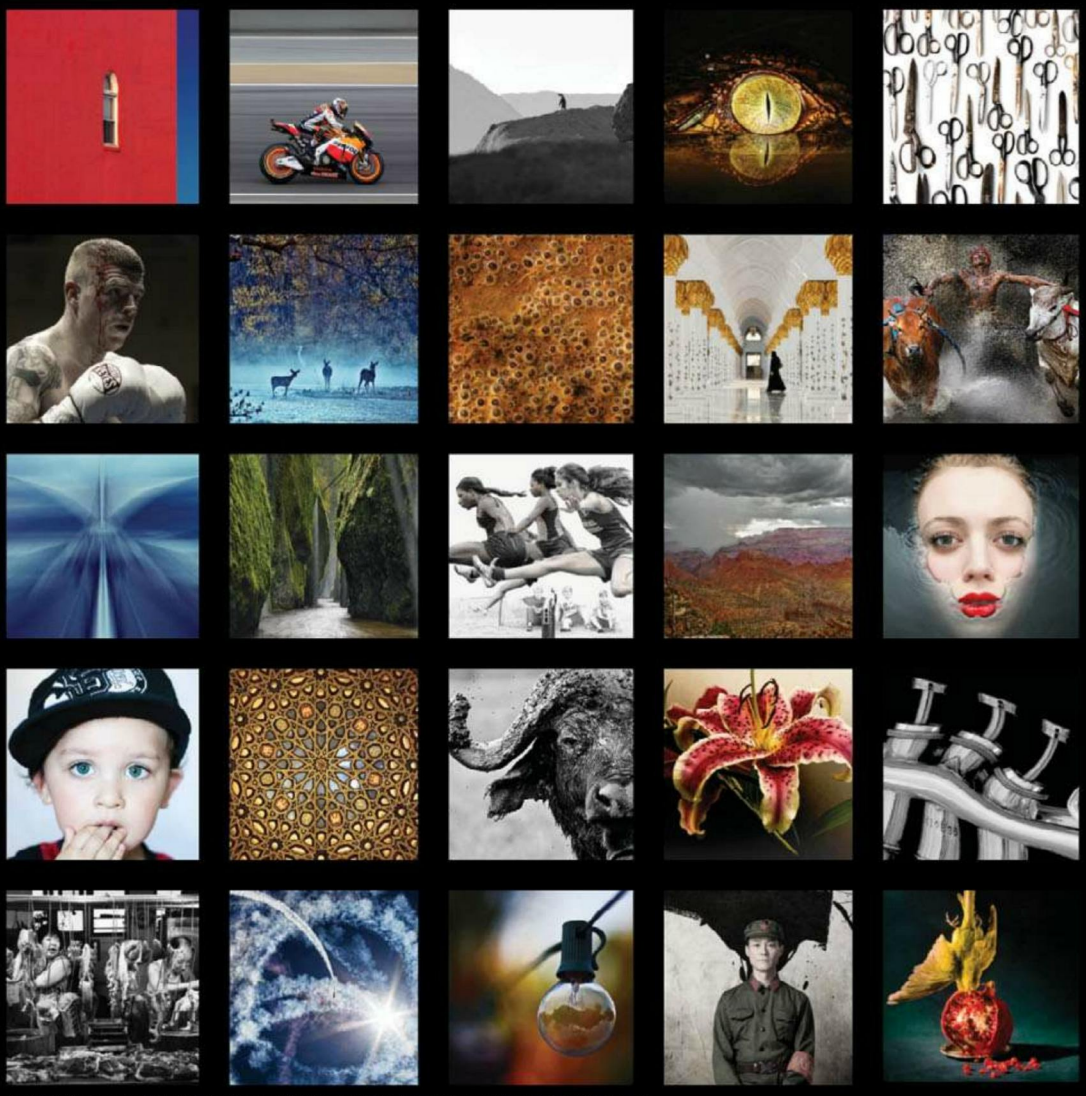
The 19th Annual Readers' PHOTO CONTEST

FROM THE SHORES of South Africa to a basement in Lincoln, NE, you, our readers, found beautiful images wherever they lurked. Whether the subject was glamorous and exotic or simply a collection of household items, this year's submissions impressed our editors enough that we couldn't resist giving you a peek at the finalists (included below). The 2012 edition of our Readers' Contest just proves what we already knew: You can make great pictures. *By Matthew Ismael Ruiz*



FROM TOP LEFT: LEN SEEVE; JOE YANG; PAUL RODE; BHAVYA JOSHI; JIM GOLDEN; TRI NGUYEN; SIDDHARTHA VARMA; JENNIFER MOEWS; FAISAL ALMALKI; WEI-SENG CHEN; FAISAL ALMALKI; PETER LIK; ROBERT SCHROETER; GABOR BALAZS; MARC LAMEY; JESSICA LINCE; LEVENT ERUTKU; STACEY DENHAM; LYNDON RICH; KAREN HARRIS; BRAD COOK; BRIAN FRANK; JONATHAN QUINONES-BERRY; JOHN CHANG; ROBERTO GRECO

THUMBNAILS OF WINNERS AND FINALISTS—SEE FULL IMAGES AT POPPHOTO.COM/READERSCONTEST2012

CLETO
REYES

ACTION/ SPORTS

Tri Nguyen, 39, technology consultant and photographer, Alexandria, VA

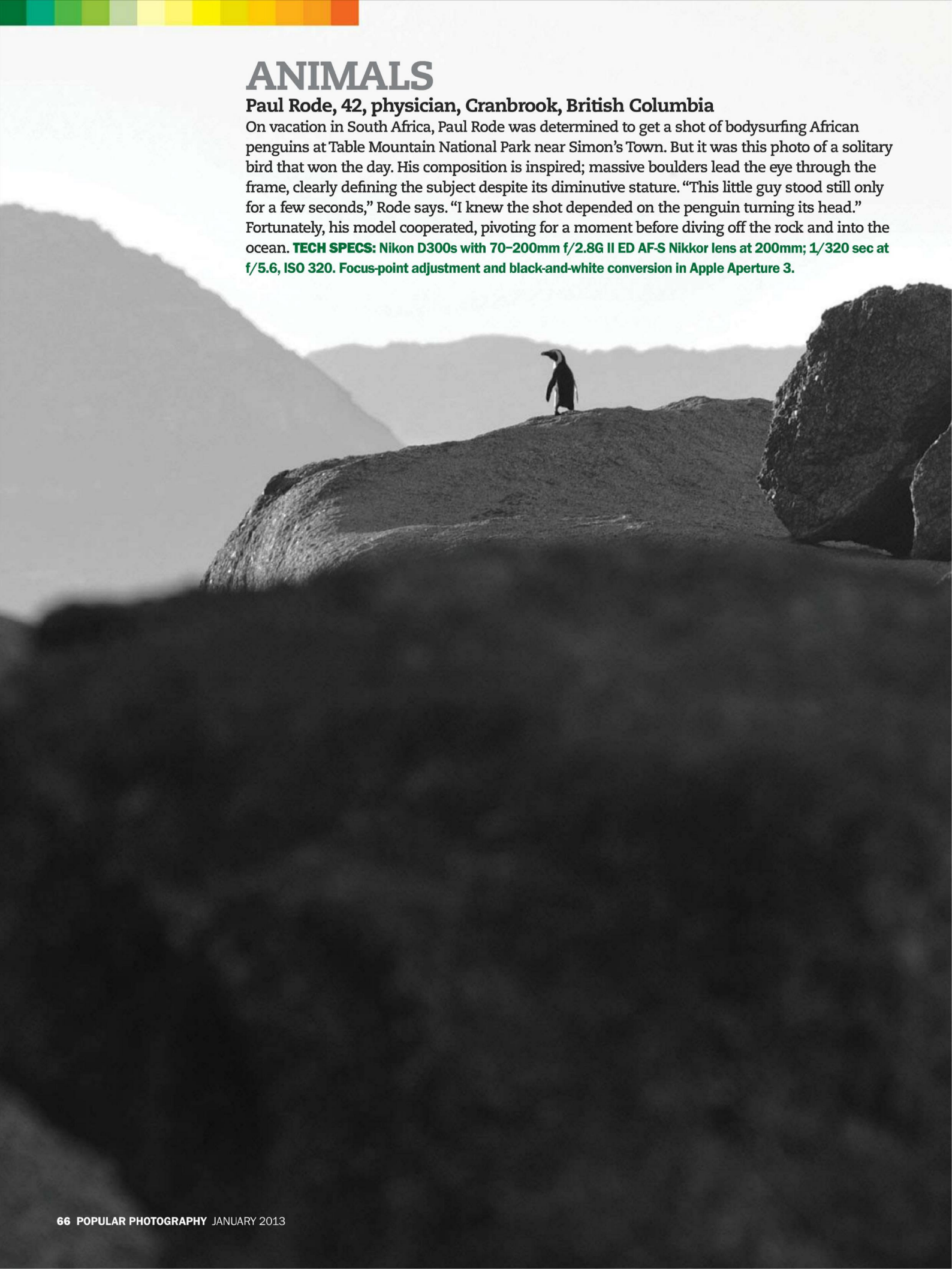
Tri Nguyen's visceral perspective on the world of professional boxing has caught our attention more than once; in fact, he won First Prize in our November 2012 Your Best Shot competition. This plaintive photograph of Todd "White Lightning" Wilson, bleeding from the head in the ring after absorbing an accidental head-butt early in a fight, shows why. Shooting ringside, Nguyen (www.georgetownproductions.com) found this solitary moment during a fight so rough that Nguyen had to wipe blood off his camera lens between rounds. Isolating his subject from spectators, coaches, and his opponent, Nguyen expertly captures the fighter's dogged determination and focus that led him to victory.

TECH SPECS: Canon EOS 7D with 50mm f/1.2L Canon EF lens; 1/500 sec at f/1.8, ISO 1600. Crop and exposure adjusted in Adobe Photoshop Lightroom 4.

ANIMALS

Paul Rode, 42, physician, Cranbrook, British Columbia

On vacation in South Africa, Paul Rode was determined to get a shot of bodysurfing African penguins at Table Mountain National Park near Simon's Town. But it was this photo of a solitary bird that won the day. His composition is inspired; massive boulders lead the eye through the frame, clearly defining the subject despite its diminutive stature. "This little guy stood still only for a few seconds," Rode says. "I knew the shot depended on the penguin turning its head." Fortunately, his model cooperated, pivoting for a moment before diving off the rock and into the ocean. **TECH SPECS: Nikon D300s with 70–200mm f/2.8G II ED AF-S Nikkor lens at 200mm; 1/320 sec at f/5.6, ISO 320. Focus-point adjustment and black-and-white conversion in Apple Aperture 3.**



OBJECTS/STILL LIFE

Karen Harris, 69, retired music teacher, Lincoln, NE

A former trumpet major at the University of Nebraska, Karen Harris has more than a few wind instruments in her basement to serve as models for her photography. While making this surrealistic image of her instrument of choice, her biggest enemy was glare. So she combated that unwanted shine with a tiny aperture, a long exposure, a black velvet backdrop, and a well-placed piece of cardboard. But it's the optical swirl that injects movement into an otherwise stationary subject—she added just the right amount of distortion in Photoshop after the shoot. Music was the driving force behind her aesthetic choice. "The inspiration for the distortion came from the idea of the fluidity of music," Harris says. "How it is never still, but always moving."

TECH SPECS: Nikon D200 with 60mm AF Micro Nikkor lens; 13 sec at f/36, ISO 200. Spot removal and Pinch Distortion Filter in Adobe Photoshop CS5.

PEOPLE

Marc Lamey, 50, sales executive, Paris, France

An homage to the music video for Kylie Minogue's duet with Nick Cave, "Where the Wild Roses Grow," this shot is from Marc Lamey's series *Women, Water, and Color*. The serene look on the model's face belies the fact that she is about to be enveloped by the black water (dyed with food coloring); Lamey says the image speaks to the duality of water as a sustainer of life as well as a potential instrument of death. Her gaze is undeniably magnetic, and her captivating green eyes seem to pull us into the depths with her. Shooting with a 50mm lens forced Lamey to get up close and personal with the subject. "It's usually said to be uncomfortable," Lamey says. "But being close up creates a strong link with the model within their personal space, and makes for strong portraiture." **TECH SPECS:** Nikon D700 with 50mm f/1.4G Nikkor AF-S lens; 1/250 sec at f/6.3, ISO 1000. Two Nikon SB900 Speedlights with umbrellas. Curves, vibrance, contrast, and clarity adjusted in Lightroom 4.

NATURE/ LANDSCAPES

Peter Lik, 52, president and photographer, LIK USA, Las Vegas, NV

Trekking into the flooded Columbia River Gorge in Oregon (against the advice of park rangers), Peter Lik (www.lik.com) waded in neck-deep water while holding his gear above his head and struggling to get to a spot shallow enough to unfold his tripod. As he stood in awe of the scene before him, the sun poured into the gorge just long enough for Lik to fire off three frames. "The shafts of light in the canyon were among the most amazing things I've ever seen," says Lik. "Adrenaline kicked in, and the sight of the weeping walls blew my mind." A small aperture helped render the "weeping" walls with incredible sharpness, and the vanishing point leads us into the abyss. **TECH SPECS: Phase One IQ180 with Phase One AF 75–150mm f/4.5 lens at 150mm; 1/4 sec at f/16, ISO 35. Really Right Stuff tripod, edits in Capture One Pro 6 and Photoshop CS6.**

PEOPLE'S CHOICE

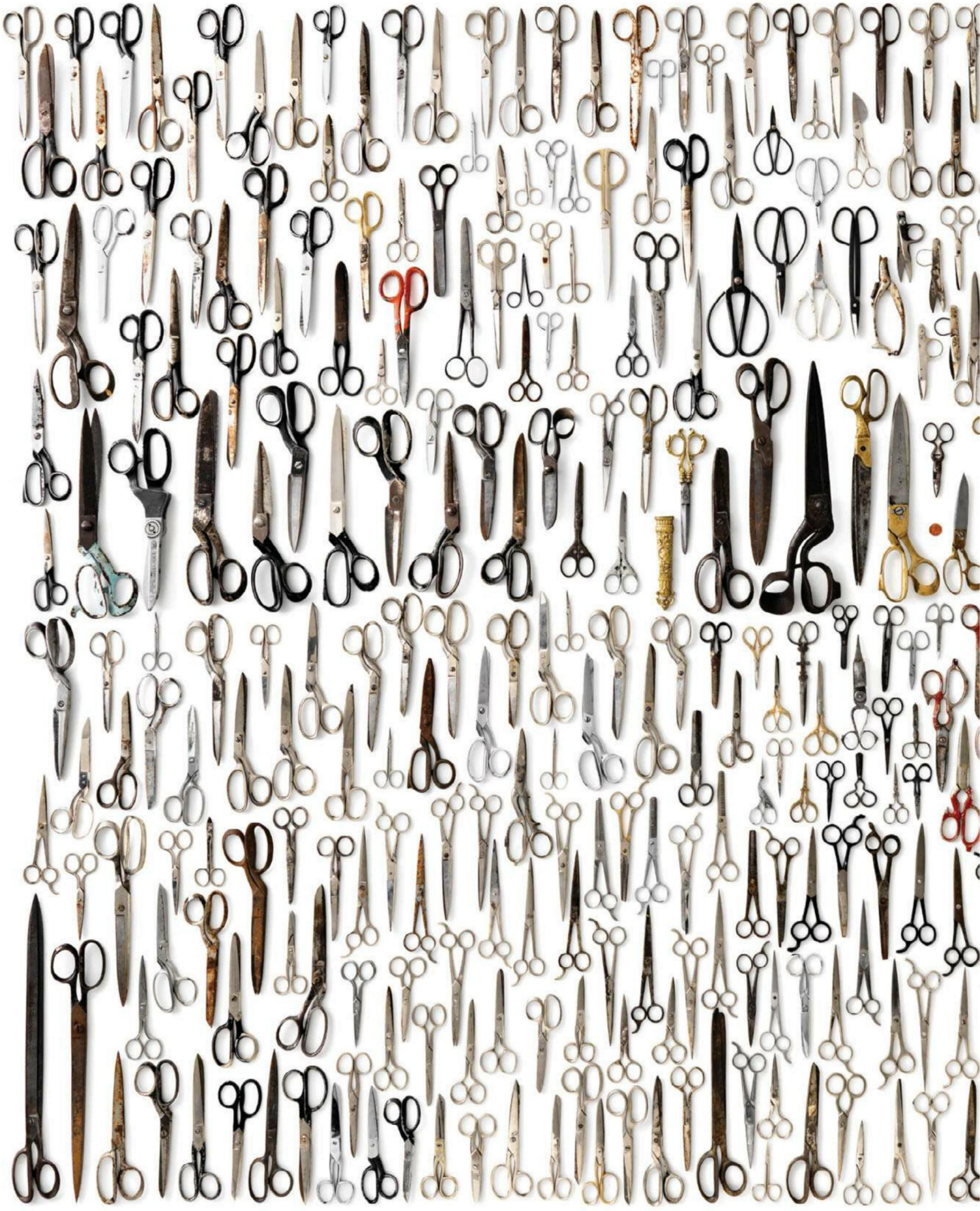
Siddhartha Varma, 26, web developer, Herndon, VA

Visitors to PopPhoto.com voted this photograph as a favorite, and we are inclined to agree. Driving to work early one morning, Siddhartha Varma noticed a vista that was just too pretty to ignore. Though he quickly pulled his car just off the road, it wasn't until just as he was about to pack up and continue on his way that "these deer came out of nowhere." He notes: "I was just lucky enough to shoot them." Framed by the tree branches and the rising mist, the riverbed's blue hue gives the image a mystical, otherworldly quality that prompted Varma to name the image "Pandora—Heaven on Earth." Take into account the fact that he shot handheld with a massive telephoto lens, and his ability to freeze the deer amid the morning fog becomes all the more impressive. **TECH SPECS: Canon EOS 5D Mark II with 400mm f/2.8L IS USM Canon EF lens; 1/320 sec at f/4, ISO 500. Sharpening and vibrance adjusted in Lightroom 3.**

CITIES/ARCHITECTURE

Faisal Almalki, 36, marketing consultant, Riyadh, Saudi Arabia

Faisal Almalki had been dreaming of visiting the famous Sheikh Zayed Grand Mosque in Abu Dhabi ever since it opened. "But by the time I made it," he explains, "I had already seen hundreds of beautiful photos of its every corner." Almalki scoured the grounds for the perfect location and finally settled on this row of gold-topped columns, with the mosque's panels of white marble acting as an ideal reflector. Looking to add a touch of life and to give the viewer a sense of scale without drawing too much attention away from the architecture, Almalki paused before clicking the shutter. He waited until a female visitor, clad in the traditional *ayaba* covering, crossed into view. With her presence, he knew he had the shot. And we were just as mesmerized as he was by this stunning exercise in visual contrast and perspective. **TECH SPECS: Canon EOS 5D Mark II with 24–105mm f/4L IS USM Canon EF lens at 84mm; 1/125 sec at f/5, ISO 100. RAW conversion in Canon Digital Photo Pro; Contrast and levels adjusted in Photoshop CS5.**



GRAND PRIZE

Jim Golden, 38, photographer, Portland, OR

Rob Roy, a friend of the photographer, has been collecting these scissors for 20 years. Sourced from all over the world, "they tell the tale of trades in which they have been plied," Jim Golden says. The meticulous arrangement was an ambitious undertaking; Golden found himself spending hours preparing the shot only to scrap the arrangement and start over. His final shot is breathtaking, if paradoxical; a completed puzzle of distinct yet similar objects. Golden says he has been shooting apparel and footwear in this style commercially for years (jimgoldenstudio.com), and wanted to try the technique on his friend's collection. "I like to photograph surveys of objects or people, then take a step back and look at the images as a group," he says. "It's my way of exploring a subject." **TECH SPECS: Hasselblad H3D2-39 with 50mm f/3.5 II Hasselblad HC lens, tethered to 27-inch Apple iMac with Hasselblad Phocus; 1/160 sec, f/8, ISO 50. Profoto D4 2400 pack, Acute/D4 head, and Giant 7-foot umbrella bounced into white cyclorama, mounted on Avenger C-stands; PocketWizard Plus 2, Really Right Stuff L bracket and Arca mounting system; Majestic geared tripod head on 10-foot Foba Asaba stand. Retouching and five-shot bracket combined in Photoshop CS5.**

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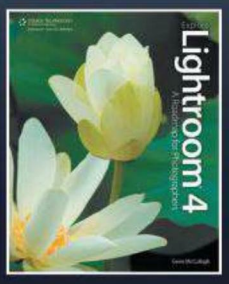

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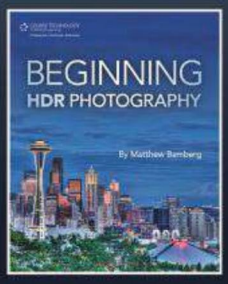

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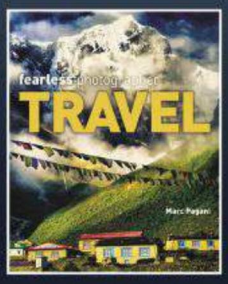

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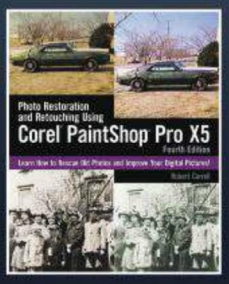

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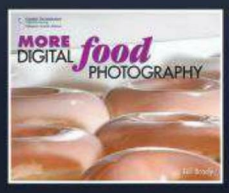

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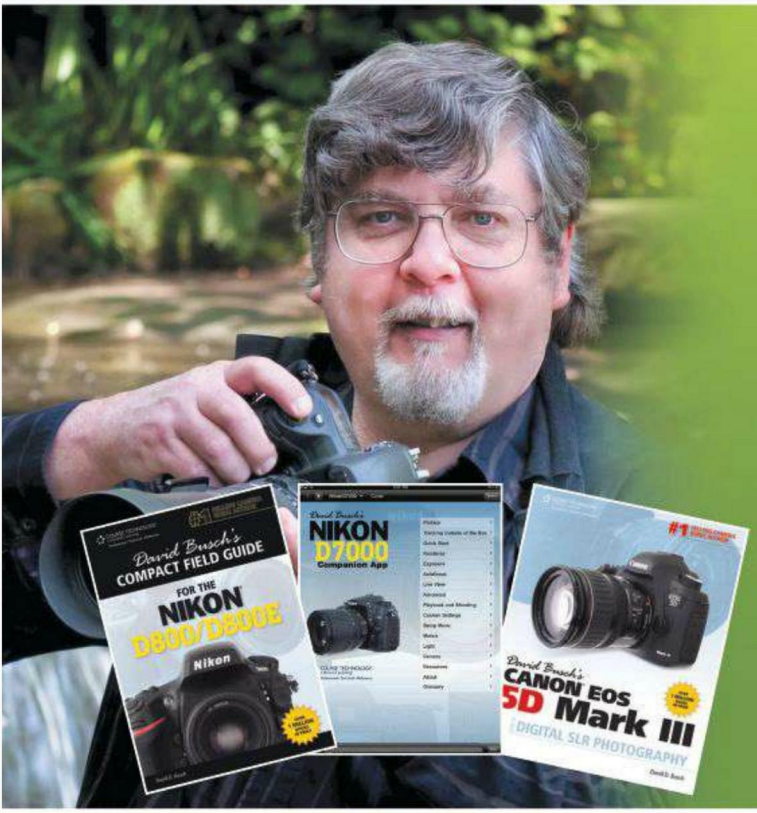

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AUTHORITATIVE TESTS, REVIEWS, AND BUYING ADVICE

LAB TESTS: SONY ALPHA 99 AND SIGMA 18–250MM F/3.5–6.3 82

84

HANDS-ON: TOKINA REFLEX 300MM F/6.3 86

ILC TEST

SIX APPEAL

SATOSHI

SONY ALPHA NEX-6

16.1MP APS-C Exmor CMOS sensor
Built-in Wi-Fi
1920x1080p60 video capture
ISO 100–25,600
$848, street, body only; $998 with 16–50mm f/3.5–5.6 lens

Sony's NEX-6 is an elegant approach to mirrorless

WHAT DO you do when your award-winning interchangeable-lens compact camera has too many fans that can't afford to buy it? If you were Sony, you'd take most of what everyone loves about the Alpha NEX-7 and put it into a body that's a better fit for their wallets—the NEX-6 ($848, street, body only; $998 with 16–50mm f/3.5–5.6 lens).

The new model has a very similar body design, the same lovely OLED electronic viewfinder as its pricier sibling, and the same change-on-the-fly soft-key interface common to all of Sony's E-mount ILCs. It also

AMATEUR PRO

uses Sony's new more-standard Multi Interface Shoe in place of the NEX-7's legacy Minolta hot-shoe.

What's missing? The NEX-6 dials down the pixel count—to 16.1MP from 24.3MP on the NEX-7—and eliminates the third command dial. As you might guess, fewer pixels mean that the NEX-6 loses the resolution battle to the NEX-7, but it also brings better noise performance.

In the Test Lab

Since Sony doesn't yet produce a real E-mount equivalent to the 50mm f/1.4 that we typically use as a test lens, we continue to test its NEX cameras with their respective kit lenses. In this case, that's the 16–50mm f/3.5–5.6 OSS retractable zoom. We set the lens to 35mm (approximately a 52mm full-frame equivalent) and then captured our test images at f/8 as we always do. Under those conditions, the NEX-6 earned a Very High rating in overall image quality from ISO 100 through ISO 3200. At lower ISOs, resolution was the limiting factor, while noise became the limit at higher ISOs.

Although it came quite close to our lower cutoff of 2250 lines per picture height for an Extremely High rating, the NEX-6's resolution of 2225 lines at ISO 100 managed only a Very High rating. It held on to enough res to remain Very High up to ISO 12,800 with 2000 lines, the bottom edge of that rating.

To compare, Panasonic's Lumix GX1 with its kit lens served up 2530 lines at ISO 100 and 2180 lines at ISO 12,800. But the GX1's images were also significantly

SONY ALPHA NEX-6

WHAT'S HOT

Very High image quality through ISO 3200.

WHAT'S NOT

3-fps bursts not as fast as we'd like to see.

WHO IT'S FOR

Shooters looking for a mid-level ILC who don't need the resolution of the NEX-7.

PHILIP RYAN (LCD IMAGE)

noisier at its software's default noise-reduction settings. We suspect that if you applied enough noise reduction to get the GX1 to match the NEX-6's noise results at ISO 12,800, then the Panasonic would fall behind the Sony in resolution.

A similar scenario plays out with Fujifilm's X-Pro 1, though this model showed better noise control than the Panasonic and would give the Sony stronger competition at ISO 12,800. The Fujifilm is significantly more expensive, though, and targets a different kind of photographer.

In our color accuracy test, the NEX-6 barely earned an Excellent rating with an average Delta E of 7.9. By comparison, the Panasonic GX1 turned in an impressive 5.8, while the Fujifilm X-Pro1 was one of the rare cameras to receive the one-notch-lower Extremely High rating, with a Delta E of 9.3.

When we factor noise into our overall image quality rating, we look for the span of ISOs for which the noise rating is Low or better. The NEX-6 meets this criterion from ISO 100 through ISO 3200. However, it's worth noting that up to ISO 1600, the NEX-6 showed Very Low or Extremely Low ratings. This is outstanding for an ILC and it even beats such DSLRs as Canon's EOS Rebel T4i and EOS-1D X, as well as Nikon's D4.

In the Field

Even a camera overflowing with noise-free resolving power would be worthless if you couldn't control it properly. Ergonomics and controls are where the NEX-6 really showed its value.

Despite its small size, the camera has a pleasing grip: While not tall enough to accommodate your little finger (unless you have tiny hands), it nonetheless feels secure when you hold it. We also appreciate the space-saving strategy of placing the mode dial atop the command dial. The latter is easy enough to turn that you're not likely to accidentally change modes when you meant only to, say, stop down the aperture.

We'd expect that a fair number of avid shooters will be won over by the Sony NEX-6.

Given that the NEX-7 lets you use three different command wheels independently, we were a little perplexed that the NEX-6 won't let you assign a function to the wheel on the back of the camera when you are not in manual exposure mode. In that mode, the rear wheel controls shutter speed, but in aperture-priority mode, it controls nothing at all. Why can't we program it to adjust exposure compensation or ISO? These each are quickly accessible via the shortcuts on the four-way controller, yes, but having exposure compensation at the ready on a command wheel can be a great boon to shooting in autoexposure modes. (Note to Sony: Please consider a firmware update to remedy this.)

In addition to the usual cool Sony features, such as Sweep Panorama (for automatic stitching), Handheld Twilight (for low-noise low-light shots), and Auto HDR, the NEX-6 adds built-in Wi-Fi as well as the same focus-peaking found in the Alpha 99 (see our description of that in the test on page 82) for easier manual focusing.

You can pair the NEX-6 with your iPhone or Android device via a download of Sony's PlayMemories Mobile app, which allows you to simply and easily transfer images from the camera to your phone for upload to your favorite image-sharing website or app. Once set up, the process becomes pleasingly seamless. On one occasion, we were able to share an image immediately after it was shot, and we already had a request for a print by the time we got home. This helped us prioritize our RAW conversions.

Though there is no microphone input on the NEX-6, its Multi Interface shoe can accept Sony's shoe-mount microphones or its XLR-K1M adapter ($798, street) for seriously high-end audio with full level controls.

TEST RESULTS

SLIK
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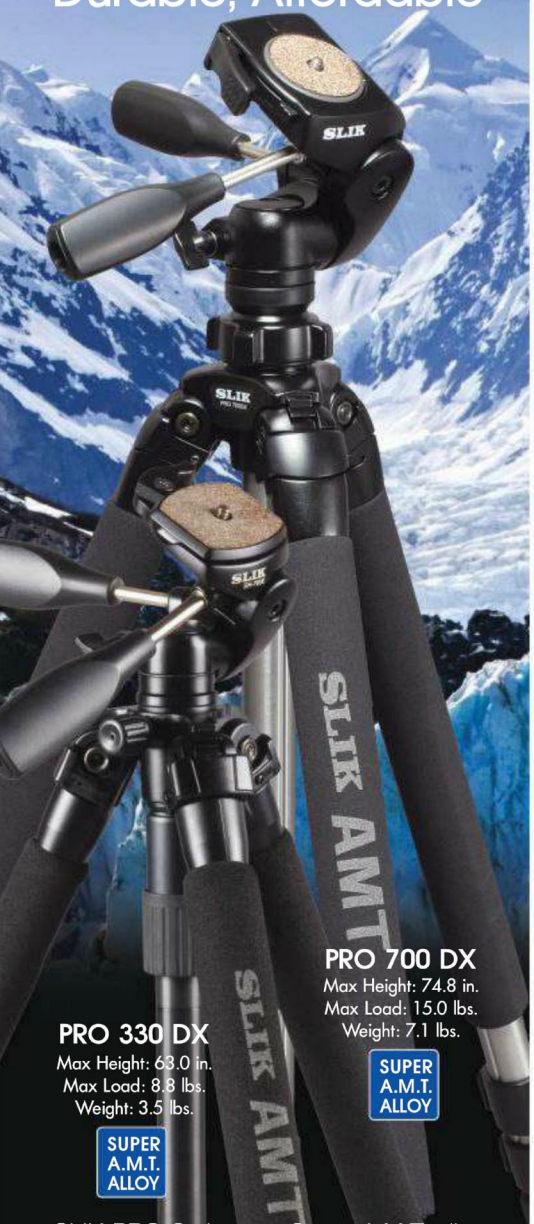

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As is typically the case in ILCs of late, the NEX-6 focuses quickly in bright light and slows down noticeably in dimmer scenarios. Switching from the kit lens to Sony's fancy (and pricey) 24mm f/1.8 sped things up, thanks to the extra light hitting the sensor. The autofocus system did a reasonable job of keeping up with moving subjects once it achieved its initial lock.

Video shot with the NEX-6 compares favorably with footage captured with other APS-C-format mirrorless cameras—there's plenty of detail and pleasingly saturated colors. Plus, the AVCHD files should be fairly easy to work with in most video-editing software.

The Bottom Line

The ILC market continues to evolve rapidly, and the NEX-6 fills a spot that Sony hadn't yet addressed. Considering how many photographers we've encountered who have described the NEX-7 as being just a little too expensive for them, we'd expect that a fair number of avid shooters will be won over by this model. Sony's line of lenses still doesn't match the selection you can get in the Micro Four Thirds format, but recent additions have been promising.

If you are looking for an ILC as a second camera, the fact that the NEX-6 doesn't have as much resolving power as some models shouldn't be much of an issue. If it's to be your main camera, then you'll have to decide whether the resolution it delivers is enough for you. For most people, the NEX-6's resolution will indeed be enough, especially for casual, everyday shooting. Even with modest cropping of images from the camera, you can produce very nice prints at 13x19-inches or even greater enlargement—bigger than most non-pros will ever print. And if you don't plan to print at all, the NEX-6 makes a wonderful companion to your cell phone. But be forewarned: some of your Facebook friends may want you to shoot their weddings and parties after they see what you can capture with this camera. —*Philip Ryan*

SPECIFICATIONS

IMAGING: 16.1MP effective, APS-C-sized CMOS sensor captures images at 4912x3264 pixels with 12 bits/color in RAW mode.

STORAGE: SD/Memory Stick Pro slot stores JPEG, ARW RAW, and RAW + JPEG files.

BURST RATE: Full-sized JPEGs (Fine mode), up to 24 shots at 3 fps; RAW (12-bit), up to 15 shots at 3 fps using an SDHC UHS-I card.

AF SYSTEM: TTL hybrid phase/contrast detection with 99 phase and 25 contrast focus points; single-shot and continuous AF. Sensitivity rated down to EV 0 (at ISO 100, f/2.8).

SHUTTER SPEEDS: 1/4000 to 30 sec, plus B (1/3-EV increments); shutter life not rated.

METERING: TTL metering with 1200-zone Multi-segment (evaluative), centerweighted, spot (size of spot not specified). EV 0–20 (ISO 100).

ISO RANGE: Stills, ISO 100–25,600 (in 1/3-EV increments); Video, ISO 100–6400.

VIDEO: Records at 1920x1080p at up to 60 fps in AVCHD v. 2.0; at 1440x1080p at 30 fps in MPEG-4 MOV format; built-in stereo microphone; no built-in mic input.

FLASH: Built-in pop-up; GN 20 (feet); Multi Interface shoe for dedicated flash or other accessories; flash sync to 1/160 sec.

VIEWFINDER: Fixed eye-level OLED with 2,359,296-dot resolution.

LCD: 3-inch TFT with 921,600-dot resolution; 5-step brightness adjustment.

OUTPUT: USB 2.0, mini HDMI video, composite video, analog audio, and Wi-Fi.

BATTERY: Rechargeable NP-FW50 Li-ion, CIPA rating 270 shots (with EVF) or 360 (with LCD screen).

SIZE/WEIGHT: 4.8x2.8x1.1 in., 0.8 lb with a card and battery.

STREET PRICE: $848, body only; $998, with E-mount 16–50mm f/3.5–5.6 OSS retractable zoom lens.

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WE TOOK a preproduction version of the Sony Alpha 99 ($2,798, street, body only) out for a field test a couple of months ago. We thoroughly enjoyed the various innovations that Sony built into its latest transmissive-mirrored camera body—the first of its kind to sport a full-frame sensor. But we never make our final assessments of image quality or other performance criteria until we can test a final production sample. That time has come.

In the Test Lab

The A99 impressed us with an overall image quality rating of Excellent from ISO 50 through ISO 1600. Ironically, though this is a full-rame DSLR, the limiting factor here ended up being noise. To compare, while we saw Canon's EOS 5D Mark III hold noise to a Low or better rating all the way up to ISO 12,800 in the test in our July 2012 issue, the A99 could make that claim only to ISO 1600. (This doesn't mean the images are horribly noisy; it just means the Canon's are cleaner.)

When it comes to resolving power, the A99 delivers a lot, but you might expect it to do even better with its 24.3MP Exmor CMOS sensor. At ISO 50, it served up 2825 lines per picture height. Sony's last full-frame DSLR, the A900, yielded 3230 lines with its 24.6MP sensor.

As the sensitivity increases, though, the A99 does a good job of retaining resolution. At ISO 1600, it achieved 2650 lines.

CONTINUES ON PAGE 97

SONY ALPHA 99
WHAT'S HOT
Speedy AF; Excellent image quality.
WHAT'S NOT
Images not as noise-free as we'd like.
WHO IT'S FOR
Sony A-mount shooters who want a really rugged and feature-rich body.

PHILIP RYAN (LCD IMAGE)

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Trim Glass

SIGMA SHRINKS ITS ALL-IN-ONE

FOR TRAVELERS, size counts. So Sigma has slimmed its APS-C-format wide-to-tele zoom. Its new 18–250mm f/3.5–6.3 DC Macro OS ($549, street) weighs 5 ounces less than its predecessor, extends to 6.3 inches (down from 7), and takes 62mm filters, not 72mm.

Scaling up to a 29–400mm equivalent on our Canon EOS Rebel T3i, this 13.8X zoom is compact enough to cast no shadow when used with a pop-up flash. Besides an Optical Stabilizer, it boasts a quiet HSM focusing motor, brass lensmount, three aspheric elements, and a low-dispersion glass element. And it's the first Sigma with a "thermally stable composite" housing to resist expansion and contraction when ambient temperature fluctuates.

In use, it provides fast, quiet, and sure autofocus, with smooth turning actions for the zoom and focus rings. The latter's 60-degree turning radius is too short for our tastes and makes for coarse manual focusing, but the AF is so good that we're sure typical users will only rarely use MF.

In our optical bench tests, the lens produced Excellent-range SQF scores at 18-, 35-, and 100mm,

CONTINUES ON PAGE 100

SIGMA 18–250MM F/3.5–6.3 DC MACRO OS HSM

WHAT'S HOT
Big zoom range, excellent AF, compact.

WHAT'S NOT
Soft at 250mm.

WHO IT'S FOR
APS-C shooters who want to upgrade to a trim, stabilized superzoom.

SPECIFICATIONS

18–250MM (18.68–249.18mm tested), f/3.5–6.3 (f/3.50–6.51 tested), 16 elements in 13 groups. Focus ring turns 60°. Zoom ring turns 80°. Focal length marked at 18-, 28-, 35-, 50-, 80-, 135-, and 250mm.
DIAGONAL VIEW ANGLE: 76–6°.
WEIGHT: 1.11 lbs. **FILTER SIZE:** 62mm.
MOUNTS: Canon AF, Nikon AF, Pentax AF, Sigma AF, Sony AF.
INCLUDED: Lenshood.
STREET PRICE: $549.
WEBSITE: sigmaphoto.com

TEST RESULTS

DISTORTION: At 18mm, 0.46% (Visible) barrel. At 35mm, 0.37% (Visible) pincushion. At 100mm, 0.32% (Visible) pincushion. At 250mm, 0.23% (Slight) pincushion.
MACRO DISTORTION: At 250mm, 0.07% (Imperceptible) pincushion.
LIGHT FALLOFF: At 18mm, gone by f/4. At 35mm, 100mm, and 250mm, none.
MACRO FALLOFF: At 250mm, none.
CLOSE-FOCUS DISTANCE: 12.23 in.
MAXIMUM MAGNIFICATION RATIO: At 18mm, 1:10.27. At 35mm, 1:6.35. At 100mm, 1:2.86. At 250mm, 1: 2.49
STABILIZATION: 2–2.5 stops.

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Samsung NX1000

Style and Perfection, All in One

Samsung's mirrorless NX1000 interchangeable lens camera sports a 20.3MP CMOS sensor, a 3-" TFT LCD & records HD video at 30 FPS. Built-in Wi-Fi connectivity lets you connect to a wireless network. Save photos & videos directly to a computer or cloud service while you shoot, email them, print them wirelessly, or upload them straight to Facebook, Twitter or YouTube. You'll never have to worry about losing a great shot, running out of storage space, or remembering to bring the right cable along.

Sony Alpha NEX-5N

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Tamron AF18-270mm F/3.5-6.3 Di II VC (Vibration Compensation) LD Aspherical (IF) Macro

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The AF 18-270 covers an angle of view equivalent to that of a 28mm wideangle to a 419mm ultra telephoto with just one lens, letting the user capture once-in-the-lifetime images of panoramic landscape images or close-up pictures of children smiling, without having to get too close to the subject and without having to change lenses.

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XA10 Pro HD

The On-the-go Videographer's Dream

This feature-rich, professional model records Full HD 1080p to either its 64GB internal flash drive or 2 SDXC-compatible card slots. Including the ability to record simultaneously to both cards for instant backup. It includes a detachable handle for low-angle shooting and portability. A Genuine Canon 10x HD Video Lens delivers a wide, flexible zoom range (35mm equivalent range 30.4mm-304mm) and smooth, pleasing backgrounds.

Vixia HF R300

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The VIXIA HF R300 is equipped with flexible features to suit your shooting and sharing needs. Superb imaging is ensured with Canon's 3.28 Megapixel Full HD CMOS Image Sensor and DIGIC DV III Image Processor. Full HD Video is steady and clear even at the large end of the 51x Advanced Zoom

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Micro Tele

TOKINA PUTS A LOT OF REACH IN A SMALL BARREL

IF YOU HAD told us that a lensmaker would introduce a mirror lens for Micro Four Thirds ILC cameras, we would have said, "What in the world for, other than the ability to make donuts?" (That refers to the distinctive ring-shaped highlights that mirror lenses typically create in out-of-focus areas.)

But Tokina's Reflex 300mm f/6.3 MF Macro ($369, street), makes a pretty good case for it. For starters, with the 2X magnification factor of the Four Thirds sensor in Olympus and Panasonic cameras, this optic has the equivalent angle of view of a 600mm lens on a full-framer. The smaller image circle needed for the Four Thirds sensor also means that the lens has less bulk than one made for larger sensors.

And a mirror lens's design results in a barrel that's much shorter than that of a conventional lens of the same focal length. So this Tokina supertele is about the size and weight of a 90mm lens in the Micro Four Thirds system. (For more on the technical aspects of mirror lenses, see Tech Talk, page 32.)

The metal-barreled Tokina is solidly constructed and nicely finished in satin gray and satin silver. The included lenshood is finished in a stippled matte black, has full internal dead-black flocking, and reverses for storage on the lens.

The fine milling on the wide focusing ring provides a secure

CONTINUES ON PAGE 104

TOKINA REFLEX 300MM F/6.3 MF MACRO

WHAT'S HOT

Tremendous tele reach for its size.

WHAT'S NOT

Sluggish manual focus; a little soft.

WHO IT'S FOR

Micro Four Thirds fans looking for supertele fun at modest cost.

SPECIFICATIONS

300MM f/6.3, 7 elements in 3 groups. Focus ring turns 290 degrees.
DIAGONAL VIEW ANGLE: 4.13°.
WEIGHT: 0.66 lbs. **FILTER SIZE:** 55mm.
MOUNTS: Micro Four Thirds (Olympus, Panasonic ILCs).
INCLUDED: Lenshood.
STREET PRICE: $369.
WEBSITE: tokinalens.com

TEST RESULTS

DISTORTION: 0.15% (Slight) pincushion.
LIGHT FALLOFF: None.
CLOSE-FOCUSING DISTANCE: 30.13 inches.
MAXIMUM MAGNIFICATION RATIO: 1:1.9.

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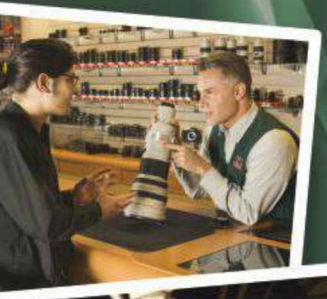

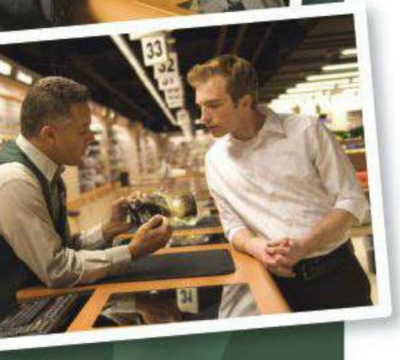

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64GB	112.95	259.95	399.99	—	—	—	—	222.50	413.00	—	184.95	349.00	—
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128GB	229.99	—	179.95	279.95	—	184.95	—
256GB	—	—	399.95	**Note:** Not all devices support SDXC cards			

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8GB	17.95	28.95	—	17.50	—	12.50	21.00	28.95	54.95	17.50
16GB	29.95	45.95	39.95	24.95	43.95	14.95	39.50	34.95	99.95	29.95
32GB	49.95	91.95	99.95	39.95	79.00	36.50	64.50	69.95	196.50	59.50

SD HC Secure Digital High Capacity

	Delkin		Kingston			Lexar		Sandisk				Sony	
	Pro Class 6	Pro Class 10	Standard Class 4	Ultimate X Class 10	Micro Class 4 Multi Kit	Std Class 4	Platinum II 100x	Std Class 4	Ultra	Extreme Class 10	Micro Class 4	Standard Class 10	Micro Class 4
4GB	—	7.95	—	—	6.29	6.45	—	6.50	7.99	12.06	6.99	—	6.99
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AT-3410	BA-00T	6.6 lb	59.4"	16.5"	3.4 lb	#OBAT3410BA00	$224.95
AT-3420	BA-0T	11 lb	62.6"	17.7"	4.2 lb	#OBAT3420BA0T	$259.95
6x Carbon Fiber Series with Head							
CT-3400	BB-0T	12.4 lb	56.7"	15"	3 lb	#OBCT3400BB0T	$349.95
CT-3410	BB-0T	16.8 lb	59.4"	16.5"	3 lb	#OBCT3410BB0T	$399.95
CT-3420	BB-1T	22 lb	62.8"	17.7"	4 lb	#OBCT3420BB1T	$449.95
CT-3500	BB-0T	12.4 lb	53.3"	12.8"	2.5 lb	#OBCT3500BB0T	$349.95
CT-3510	BB-0T	16.8 lb	60.6"	15.5"	3.2 lb	#OBCT3510BB0T	$399.95
CT-3520	BB-1T	22 lb	64.8"	16.5"	4 lb	#OBCT3520BB1T	$469.95

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- 14 Adjustable In-camera Filters
- Contrast AF, Touch AF and Light Speed AF

Kit with 14-42mm G Vario Lens..... #PADMCG5KB

16 Mega Pixels

SONY Alpha NEX-5R Mirrorless System Camera

- Fast Hybrid Autofocus
- 3.0" Tilt-able Touchscreen LCD
- Uses Sony E-mount Lenses
- Intuitive Interface with Control Dial
- Full 1080 HD 60p/60i/24p Video
- SD/SDHC/SDXC & MS Pro Duo/HG-Duo Card Slot • Wi-Fi Sharing
- PlayMemories Camera and Mobile Apps
- Low Light Performance up to ISO 25600
- Available in Black or Silver

*with 16-50mm Lens..... #SONEX5RL**
*with 18-55mm Lens..... #SONEX5RK**

16 Mega Pixels

SONY Alpha NEX-6 Mirrorless System Camera

- Fast Hybrid AF with Phase-Detection AF
- 3.0" LCD
- Uses Sony E-mount Lenses
- XGA OLED Tru-Finder EVF
- Captures 1080 HD Video
- SD/SDHC/SDXC & MS Pro Duo/Pro HG-Duo Card Slot
- Wi-Fi Capable
- Fast 10fps Burst Shooting
- PlayMemories Camera Apps

*with 16-50mm Lens.....#SONEX6L**

16 Mega Pixels

SONY Alpha SLT-A57 DSLR

- 3.0" 921,600-dot Tiltable LCD
- Full HD 1080p with AVCHD 2.0
- Sony A-mount Lens Mount (1.5x factor)
- MS/MS Pro & SD Media Slot
- Auto Portrait Framing
- ISO 100-16000
- Tru-Finder EVF

Body Only..... #SOSLTA57
Kit with 18-55mm Lens .....#SOSLTA57K

16 Mega Pixels

SONY Alpha SLT-A99 DSLR

- Sony Dual AF System & Translucent Mirror
- Full-Frame Exmor CMOS Sensor
- XGA OLED Electronic VF
- 3.0" TruBlack Tilting LCD
- Uses Sony Alpha Lenses
- MS Pro Duo/HG-Duo & SD/SDHC/SDXC Card Slots
- Internal SteadyShot Image Stabilization • Full HD 1920x1080 60p Video Recording

*Body Only.....#SOSLTA99V**

24 Mega Pixels

▸ OLYMPUS

Flash System

FL-300R Flash	169.95
FL-600R Flash	299.95
FL-50R Flash	499.95
RF-11 Ring Flash	249.95
SRF-11 Ring Flash Set	559.95
TF-22 Twin Flash	449.95
STF-22 Twin Flash Set	739.95

Zuiko 4/3 System Digital Lenses

8/3.5 Fish-eye ED	799.99
35/3.5 Macro ED (52ø)	229.95
50/2.0 Macro ED (77ø)	499.95
150/2.0 ED (82ø)	2,499.95
300/2.8 ED	6,999.95
7-14/4.0 ED (72ø)	1,799.95
11-22/2.8-3.5 ED (72ø)	799.95
12-60/2.8-4 ED SWD (72ø)	999.95
14-42/3.5-5.6 ED (58ø)	249.95
18-180/3.5-6.3 ED (62ø)	499.95
35-100/2.0 ED (77ø)	2,499.99
40-150/4-5.6 ED (58ø)	279.95
50-200/2.8-3.2 ED SWD (67ø)	1,199.95
90-250/2.8 ED (105ø)	5,999.95
EC-14 1.4x Teleconverter	439.95
EC-20 2x Teleconverter	479.95
MF-1 OM Lens Adapter	83.95

▸ PENTAX

AF Flash System

AF-360FGZ	
AF-540FGZ	

SMCP-DA Digital AF Lenses

14/2.8 ED IF (77ø)	
15/4.0 ED AL (49ø)	
35/2.8 Mac. Limited (49ø)	
55/1.4 Limited (58ø)	
21/3.2 AL Limited "Pancake" (49ø)	
40/2.8 Limited "Pancake" (49ø)	
70/2.4 Limited "Pancake" (49ø)	
200/2.8 ED IF	
300/4.0 ED IF SDM (77ø)	
10-17/3.5-4.5 ED IF (77ø)	
12-24/4 ED AL IF (77ø)	
16-45/4 ED AL (67ø)	
16-50/2.8 ED AL IF SDM (77ø)	
17-70/4.0 AL IF SDM (67ø)	
18-55/3.5-5.6 AL II (52ø)	
50-135/2.8 ED IF SDM (67ø)	
50-200/4-5.6 ED WR (52ø)	
55-300/4-5.8 ED (58ø)	
60-250/4.0 ED IF SDM (67ø)	

AF Lenses for 35mm & Digital SLRs

31/1.8 Limited (58ø)	
50/1.4 (49ø)	
43/1.9 Limited "Pancake" (49ø)	
50/2.8 Macro (52ø) with Case	
77/1.8 Limited (49ø)	
100/2.8 D FA AW Macro (49ø)	

▸ SONY

Compatible with Maxxum DSLRs

Flash System

HVL-F20AM	149.99
HVL-F20S	149.99
HVL-F43AM	349.99
HVL-F58AM	499.99

Digital Lenses

16/2.8 Fish-eye	999.99
20/2.8 (72ø)	749.99
24/2 Carl Zeiss (72ø)	1,399.99
35/1.4 G (55ø)	1,499.99
50/1.4 (55ø)	449.99
50/2.8 Macro (55ø)	599.99
85/1.4 Carl Zeiss (72ø)	1,699.99
100/2.8 Macro (55ø)	799.99
135/1.8 Carl Zeiss (77ø)	1,799.99
135/2.8 STF (72ø)	1,399.99
300/2.8 G APO	6,999.99
11-18/4.5-5.6 DT (77ø)	799.99
16-35/2.8 ZA SSM Carl Zeiss (77ø)	1,999.99
16-80/3.5-4.5 DT Carl Zeiss (62ø)	999.99
16-105/3.5-5.6 DT (62ø)	699.99
18-200/3.5-6.3 DT Aspherical (62ø)	549.99
18-250/3.5-6.3 DT (62ø)	649.99
24-70/2.8 Carl Zeiss (77ø)	1,999.99
70-200/2.8 G APO (77ø)	1,999.99
70-300/4.5-5.6 G (62ø)	999.99
75-300/4.5-5.6 (55ø)	249.99
1.4x Teleconverter	549.99
2x Teleconverter	549.99

OLYMPUS
50mm f/2 Macro ED Zuiko Digital Lens

- *Designed exclusively for Digital SLRs*
- Ideal for macro photography and also as a portrait lens
- Magnification 1:2
- ED glass element
- Min. focus: 9.45"
- 52mm filter diameter
- Weight: 10.6 oz

PENTAX
18-135mm f/3.5-5.6 ED AL (IF) DC WR Digital Lens

- *Designed exclusively for Digital SLRs*
- SP Coating Repels Dust, Water, & Grease
- Weather resistant
- Quick-Shift Focus System
- Min. focus: 1.3'
- 62mm filter diameter
- Weight: 14.3 oz

SONY
HVL-F58AM Shoe-Mount Digital Flash

- Zoom Head (24-105mm)
- Bounce & Swivel Head
- Guide No. 190'
- TTL Dedication
- Vari-Power
- High-Speed Sync
- Auto WB Adjustment
- Wireless Ratio Control
- Weight: 15.6 oz

SONY
16-80mm f/3.5-4.5 Carl Zeiss T* DT Digital Lens

- *Designed exclusively for Digital SLRs*
- Ideal for snapshots, portraits, interiors, or outdoor scenery
- 35mm equiv: 24-120mm
- Min. focus: 13.8"
- 62mm filter diameter
- Weight: 15.5 oz

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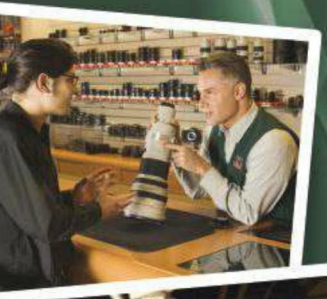

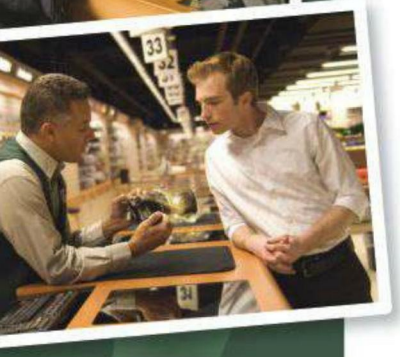

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Canon Digital Rebel T3i DSLR

- 3" Clear View Vari-Angle LCD
- Uses Canon EF Lenses (1.6x factor)
- SDHC/SDXC Card Slot
- 3.7 fps Continuous Shooting
- ISO 100-6400
- RAW + JPEG Files
- Full HD Movie Mode with Manual Exposure
- 63 Zone Dual-Layer System/9 Point AF

Expires 11-21-12

Body Only	*#CAEDRT3I*	—
Kit with 18-55mm IS	*#CAEDRT3IK*	***$50 Rebate!***
T3 Kit *with 18-55mm IS*	*#CAEDRT3K*	***$50 Rebate!***

18 Mega Pixels

Canon Digital Rebel T4i DSLR

- STM Lens Support for Quiet AF in Movies
- DIGIC 5 Image Processor
- 3.0" Vari-Angle Touch Screen LCD
- Uses Canon EF Lenses (1.6x factor)
- SDHC/SDXC Card Slot
- ISO 100-12800, Expandable to 25600
- Full HD Movie Mode with Continuous AF
- 5.0 FPS • Multi Shot Noise Reduction

Expires 11-17-12

Body Only	*#CAEDRT4I*	—
Kit with 18-55mm IS	*#CAEDRT4IK*	***$50 Rebate***
Kit with 18-135mm IS	*#CAEDRT4IKZ*	***$50 Rebate***

18 Mega Pixels

Canon EOS-60D DSLR

- 1920 x 1080 HD Video Capture
- DIGIC 4 Image Processor
- SD/SDHC/SDXC Card Slot
- Works with all Canon EF & EF-S Lenses • Vari-Angle Clear View 3.0" Flip-Out LCD
- HDMI Output to HDTV
- 5.3 fps Continuous Shooting
- ISO 6400 - Expandable to 12800

Expires 11-21-12

Body Only	*#CAE60D*	***$100 Rebate!***
Kit with 18-135mm IS	*#CAE60D18135*	***$100 Rebate!***
Kit with 18-200mm IS	*#CAE60D18200*	***$100 Rebate!***

18 Mega Pixels

Canon EOS-5D Mark III DSLR

- 3.2" Clear View High Resolution LCD
- DIGIC 5+ Image Processor
- 61-Point High Density AF
- Uses Canon EF Lenses
- Dual CF, SD Card Slots
- Extended ISO Range (50-102400)
- Built-In HDR & Multiple Exposure Modes
- Full HD 1080/30p and 720/60p Formats

Expires 11-24-12

Body Only	*#CAE5D3**	***$200 Rebate!***
Kit with 24-105mm L IS	*#CAE5D324105*	***$200 Rebate!***
5D Mark II *Body Only*	*#CAE5D2*	***$400 Rebate!***
5D Mark II Kit *with 24-105mm L IS*	*#CAE5D224105*	***$400 Rebate!***

22 Mega Pixels

Canon EOS-7D DSLR

- Record HD Video • 3" LCD
- Uses Canon EF Lenses
- CF, MD Card Slot
- Dust and Weather Resistant
- Selectable Video Exposure and Frame Rates
- ISO 100-6400 (expandable to 12800) • 8 fps Burst Mode
- 19-Point, All Cross-Type AF System

Expires 11-21-12

Body Only	*#CAE7D*	***$100 Rebate***
Kit with 18-135mm IS	*#CAE7D18135*	***$100 Rebate***
Kit with 28-135mm IS	*#CAE7D28135*	***$100 Rebate***

18 Mega Pixels

Canon EOS-1Dx DSLR

- Dual DIGIC 5+ Image Processors
- Magnesium Alloy Body
- Eye-Level Pentaprism Viewfinder
- 3.2" LCD Monitor
- Uses Canon EF Lenses
- Dual CF card slots
- 1920 x 1080 HD Video Capture
- Live View Still and Video Recording
- 61-Point High Density Auto Focus

Body Only	*#CAE1DX**	

18 Mega Pixels

Canon SLR Lenses and Flashes

Instant Rebates! Expire 12-1-12

EOS Flash System (USA)

270EX II	***$15 Rebate****	430EX II	***$45 Rebate****
320EX		580EX II	
600EX-RT	***$60 Rebate****		
MR-14EX Ringlight	***$50 Rebate****		
MT-24EX Twin Flash	***$80 Rebate****		

EF-S Lenses for Digital Only (USA)

(Not compatible with full frame cameras)

60/2.8 USM Macro (52ø)	***$60 Rebate****
10-22/3.5-4.5 USM (77ø)	***$120 Rebate****
15-85/3.5-5.6 IS USM (72ø)	***$100 Rebate****
17-55/2.8 IS USM (67ø)	***$120 Rebate****
17-85/4-5.6 IS USM (67ø)	
18-55/3.5-5.6 IS (58ø)	
18-135/3.5-5.6 IS (67ø)	
18-200/3.5-5.6 IS (72ø)	
55-250/4.0-5.6 IS USM (58ø)	

EF Lenses (USA)

20/2.8 USM (72ø)	***$50 Rebate****
24/2.8 IS USM (58ø)	***$150 Rebate****
28/1.8 USM (58ø)	***$60 Rebate****
28/2.8 IS USM (58ø)	***$100 Rebate****
35/2 (52ø)	
40/2.8 STM Pancake (52ø)	***$50 Rebate****
50/1.8 II (52ø)	***$15 Rebate****
50/2.5 Macro (52ø)	***$30 Rebate****
50/1.4 USM (58ø)	***$60 Rebate****
MP-E 65/2.8 1x-5x Macro (58ø)	***$100 Rebate****
85/1.8 USM (58ø)	***$60 Rebate****
100/2 USM (58ø)	***$50 Rebate****
100/2.8 USM Macro (58ø)	***$50 Rebate****
28-135/3.5-5.6 IS USM (72ø)	
70-300/4-5.6 IS USM (58ø)	
70-300/4.5-5.6 DO IS USM (58ø)	
75-300/4.0-5.6 III (58ø)	
75-300/4.0-5.6 III USM (58ø)	

TS-E MF Lenses (USA)

17/4.0 "L"	***$250 Rebate****		
24/3.5 "L" II	***$250 Rebate****		
45/2.8	***$100 Rebate****	90/2.8	***$180 Rebate****

EF "L" Lenses (USA)

14/2.8 USM II	***$200 Rebate****
24/1.4 II (77ø)	***$200 Rebate****
35/1.4 USM (72ø)	***$150 Rebate****
50/1.2 USM (72ø)	***$180 Rebate****
85/1.2 USM II (72ø)	***$200 Rebate****
100/2.8 IS USM Macro (67ø)	***$150 Rebate****
135/2.0 USM (72ø)	***$100 Rebate****
180/3.5 USM Macro (72ø)	***$150 Rebate****
200/2.8 USM II (72ø)	***$50 Rebate****
200/2.0 IS USM (52ø)	
300/4.0 IS USM (77ø)	***$100 Rebate****
300/2.8 IS USM II (52ø rear)	
400/5.6 USM (77ø)	***$120 Rebate****
400/2.8 IS II (52ø rear)	
500/4 IS USM II (52ø rear)	
600/4.0 IS II (52ø rear)	
8-15/4.0 Fish-eye USM	***$180 Rebate****
16-35/2.8 USM II (82ø)	***$200 Rebate****
17-40/4.0 USM (77ø)	***$100 Rebate****
24-70/2.8 II USM (82ø)	
24-105/4 IS USM (77ø)	
28-300/3.5-5.6 IS USM (77ø)	
70-200/4.0 USM (67ø)	***$80 Rebate****
70-200/4.0 IS USM (77ø)	***$200 Rebate****
70-200/2.8 USM (77ø)	***$150 Rebate****
70-200/2.8 IS II USM (77ø)	***$400 Rebate****
70-300/4.0-5.6 IS USM (67ø)	***$200 Rebate****
100-400/4.5-5.6 IS USM (77ø)	***$200 Rebate****
1.4x III Teleconverter	***$70 Rebate****
2x III Teleconverter	***$70 Rebate****

NEW Canon

Instant Rebates on Lenses & Speedlites ** Expire 12-1-12*

EOS Flash System	Price	Rebate	Final
270EX II	$169.99	$15	$154.99
430EX II	$299.99	$45	$254.99
600EX-RT	$629.99	$60	$569.99
MR-14EX Ringlight	$549.99	$50	$499.99
MT-24EX Twin Flash	$829.99	$80	$749.99

TS-E "L" MF Lenses	Price	Rebate	Final
17/4.0 "L"	$2,499.00	$250	$2,249.00
24/3.5 "L" II	$2,199.00	$250	$1,949.00
45/2.8	$1,399.00	$100	$1,299.00
90/2.8	$1,399.00	$180	$1,219.00

EF-S Digital Lenses	Price	Rebate	Final
60/2.8 USM Macro	$469.99	$60	$409.99
10-22/3.5-4.5 USM	$859.99	$120	$739.99
15-85/3.5-5.6 IS USM	$799.99	$100	$699.99
17-55/2.8 IS USM	$1,179.00	$120	$1,059.00

EF Lenses	Price	Rebate	Final
20/2.8 USM	$539.99	$50	$489.99
24/2.8 IS USM	$849.99	$150	$699.99
28/1.8 USM	$509.99	$60	$449.99
28/2.8 IS USM	$799.99	$100	$699.99
40/2.8 STM Pancake	$199.99	$50	$149.99
50/1.8 II	$125.99	$15	$110.99
50/2.5 Macro	$299.99	$30	$269.99
50/1.4 USM	$399.99	$60	$339.99
MP-E 65/2.8 Macro	$1,049.00	$100	$949.00
85/1.8 USM	$419.99	$60	$359.99
100/2 USM	$499.99	$50	$449.99
100/2.8 USM Macro	$599.99	$50	$549.99

EF "L" Lenses	Price	Rebate	Final
14/2.8 USM II	$2,359.00	$200	$2,159.00
24/1.4 II	$1,749.00	$200	$1,549.00
35/1.4 USM	$1,479.00	$150	$1,329.00
50/1.2 USM	$1,619.00	$180	$1,439.00
85/1.2 USM II	$2,199.00	$200	$1,999.00
100/2.8 IS USM Macro	$1,049.00	$150	$899.00
135/2.0 USM (72ø)	$1,089.00	$100	$989.00
180/3.5 USM Macro	$1,579.00	$150	$1,429.00
200/2.8 USM II (72ø)	$819.99	$50	$769.99
300/4.0 IS USM (77ø)	$1,449.00	$100	$1,349.00
400/5.6 USM (77ø)	$1,339.00	$120	$1219.00
8-15/4.0 Fish-eye USM	$1,499.00	$180	$1,319.00
16-35/2.8 USM II	$1,699.00	$200	$1,499.00
17-40/4.0 USM	$839.99	$100	$739.99
70-200/4.0 USM (67ø)	$709.99	$80	$629.99
70-200/4.0 IS USM	$1,349.00	$200	$1,149.00
70-200/2.8 USM (77ø)	$1,449.00	$150	$1,299.00
70-200/2.8 IS II USM	$2,499.00	$400	$2,099.00
70-300mm IS USM	$1,599.00	$200	$1,399.00
100-400mm IS USM	$1,699.00	$200	$1,499.00
1.4x III Teleconverter	$499.99	$70	$429.99
2x III Teleconverter	$499.99	$70	$429.99

Nikon 1 J2 Mirrorless Digital Camera

- EXPEED 3 Dual Image Processor
- Full HD 1080p Movie with Stereo Sound
- Interchangeable 1 NIKKOR Lens System
- 3.0" LCD • Panoramic Mode
- SD/SDHC/SDXC Card Slot
- Selective Color & Backlighting Modes
- Night Portrait & Night Landscape Modes
- Nikon Inc. limited warranty included

Valid Through 11-17-12

10 Mega Pixels

Available in Black, Orange, Pink, Red, Silver or White

	Price	Rebate	Final Cost
1 J2 Kit with 10-30mm VR *#NI1J21030**	549.95	—	—
1 J2 Kit with 10-30 & 30-110mm VR *#NI1J21030K**	799.95	$100	699.95
1 J1 Kit with 10-30 & 30-110mm VR** *#NI1J11030**	846.95	$250	596.95

Nikon D3200 DSLR

Valid Through 11-17-12

- EXPEED III Image Processor
- HD 1080p Video
- 3" LCD • Live View
- Uses Nikon AF Lenses (1.5x factor)
- SD/SDHC/SDXC Card Slot
- 11-point AF • Up To ISO 12800
- Nikon Inc. limited warranty included

24 Mega Pixels

D3200 is available in Black or Red

	Price	Rebate	Final Cost
D3200 Kit Black w/18-55mm VR *#NID32001855**	696.95	$100	596.95
D3100 Kit with 18-55mm VR *#NID31001855*	646.95	$170	476.95
D5100 Kit with 18-55mm VR *#NID51001855*	796.95	$220	576.95

Nikon D7000 DSLR

Valid Through 11-17-12

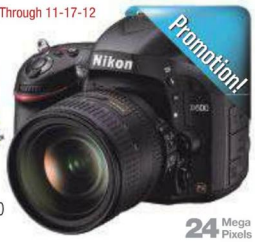
- EXPEED 2 Image Processor
- 1080p HD Video Capture
- RAW + JPEG Still Image Capture
- Accepts Nikon AF Lenses (1.5x factor) • 3" LCD Monitor
- Twin SD/SDHC/SDXC Card Slots
- RGB 3D Matrix Metering System
- Nikon Inc. limited warranty included

16 Mega Pixels

	Price	Rebate	Final Cost
Body Only *#NID7000*	1,196.95	$200	996.95
Kit with 18-105mm VR *#NID700018105*	1,496.95	$200	1,296.95
Kit with 18-200mm VR II *#NID700018200*	2,046.95	$450	1,596.95

Nikon D600 DSLR

Valid Through 11-17-12



- FX-Format (Full-Frame) CMOS Sensor
- Uses Nikon AF Lenses
- 3.2" LCD • EXPEED 3 Processor
- SD/SDHC/SDXC Card Slot
- 1080p HD Video Capture
- 5.5 fps Continuous Shooting
- 39 Wide-Area AF Focus Points
- 100-6400 ISO, Expandable to 50-25600
- Nikon Inc. limited warranty included

24 Mega Pixels

	Price	Rebate	Final Cost
Body Only *#NID600*	2,096.95	—	—
Kit with 24-85mm VR Lens *#NID6002485*	2,696.95	$100	2,596.95

Nikon D800 DSLR

- 35.9x24mm CMOS FX Format Sensor
- 3.2" LCD Monitor
- Nikon F Mount Lens Mount
- CF & SD Dual Card Slots
- Optical Low-Pass Filter
- Eye-Level Pentaprism Viewfinder
- 1920 x 1080/30/25/24p HD Video Capture • Matrix/Center-Weighted/Spot Metering
- Nikon Inc. limited warranty included

Body Only *#NID800* **2,999.95**

36 Mega Pixels

Nikon D4 DSLR

- RAW, TIFF, JPEG, RAW+JPEG Files
- FX-format (full-frame) CMOS Sensor
- 1080p HD Broadcast Quality Video
- EXPEED3 Image Processor
- 3.2" LCD Screen with Live View
- Compatible with Most Nikkor Optics
- Matrix, Center-Weighted, Spot Metering • 100-12800 ISO
- CF Type 1 & XQD Compatible
- Nikon Inc. limited warranty included

Body Only *#NID4* **5,999.95**

16 Mega Pixels

Nikon SLR Lenses and Flashes

Instant Savings! Expire 11-17-12

	Price	Final Cost
AF Flashes		
SB-400		
SB-700	326.95	296.95 [A]
SB-910	546.95	496.95 [B]
R1 Wireless Twin Flash		
R1C1 Wireless Twin Flash System		
DX ED-IF Lenses for Digital Only		
10.5/2.8 Fish-Eye		
35/1.8 G AF-S (52ø)	196.95	—
40/2.8 G AF-S Micro (52ø)	276.95	—
85/3.5 G ED VR Micro (52ø)	529.95	429.95 [C]
10-24/3.5-4.5 G AF-S (77ø)		
12-24/4 G AF-S (77ø)		
16-85/3.5-5.6 G AF-S VR (67ø)		
17-55/2.8 G AF-S (77ø)		
18-55/3.5-5.6 G AF-S II (52ø)		
18-55/3.5-5.6 G AF-S VR (52ø)	196.95	—
18-105/3.5-5.6 G AF-S VR (67ø)	396.95	—
18-200/3.5-5.6 G AF-S VR II (72ø)	846.95	596.95 [D]
18-300/3.5-5.6 G AF-S ED VR (77ø)	999.95	—
55-200/4-5.6 G AF-S (52ø)		
55-200/4-5.6 G AF-S VR (52ø)	246.95	146.95 [E]
55-300/4.5-5.6 G AF-S VR (58ø)	396.95	246.95 [F]

	Price	Final Cost
D-Type AF Lenses		
14/2.8 D ED		
16/2.8 D (39ø) with Hood		
20/2.8 D (62ø)		
24/2.8 D (52ø)		
24/1.4 G AF-S ED (77ø)		
24/3.5 D ED PC-E (77ø)		
28/1.8 G AF-S (67ø)	699.95	—
28/2.8 D (52ø)		
35/2.0 D (52ø)		
35/1.4 G AF-S ED (67ø)		
45/2.8 D ED PC-E Micro (77ø)		
50/1.8 D (52ø)		
50/1.8 G AF-S (58ø)	216.95	—
50/1.4 D (52ø)		
50/1.4 G AF-S (58ø)		
60/2.8 D Micro (62ø) (1:1)		
60/2.8 G AF-S ED Micro (62ø)		
85/1.8 D (62ø) with Hood		
85/1.4 D IF (77ø)		
85/1.4 G AF-S (77ø)		
85/1.8 G AF-S (67ø)	496.95	—
85/2.8 PC-E Micro (77ø)		
105/2.8 G AF-S ED-IF VR Micro (62ø)		
105/2.0 DC D with Hood (72ø)		
180/2.8 D ED-IF (72ø)		

	Price	Final Cost
D-Type AF Lenses		
200/4 D ED-IF Micro with Case (62ø)		
200/2 G AF-S ED-IF VR II (52ø)		
300/4.0 D AF-S ED-IF (77ø)		
300/2.8 G AF-S VR (52ø-R)		
400/2.8 G AF-S VR ED (52ø)		
500/4.0 G AF-S VR ED (52ø)		
600/4.0 G AF-S VR ED (52ø)		
14-24/2.8 G AF-S ED-IF	1,996.95	—
16-35/4.0 G AF-S ED VR (77ø)		
17-35/2.8 D AF-S ED-IF (77ø)		
24-70/2.8 G AF-S ED-IF (77ø)	1,886.95	1686.95 [G]
24-85/2.8-4.0 D IF (72ø)		
24-85/3.5-4.5 G AF-S ED VR (72ø)	596.95	496.95 [H]
24-120/4.0 G AF-S ED VR (77ø)	1,296.95	—
28-300/3.5-5.6 G AF-S ED VR (77ø)	1,046.95	896.95 [I]
70-200/2.8 G AF-S ED-IF VR II (77ø)	2,396.95	2196.95 [J]
70-300/4.0-5.6 G (62ø)		
70-300/4.5-5.6 G-AFS VR (67ø)	586.95	386.95 [K]
80-200/2.8 D with Collar (77ø)		
80-400/4.5-5.6 D VR (77ø)		
200-400/4 G AF-S ED VR II (52ø)		
TC-14E II (1.4x) Teleconverter		
TC-17E II (1.7x) Teleconverter		
TC-20E III (2x) Teleconverter		

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		Lens	Price	Savings	Final
Buy Flash [A or B] **with** any current Nikon **DSLR**	[A]	SB-700	$326.95	$30	$296.95
	[B]	SB-910	$546.95	$50	$496.95
Buy Lens [C or D] **with** D3100, D3200, D5100, D90, D7000 or D300s **DSLR**	[C]	85mm f/3.5 G ED VR Micro DX	$529.95	$100	$429.95
	[D]	18-200mm f/3.5-5.6 G DX	$846.95	$250	$596.95
Buy Lens [E or F] **with** D3000, D3100, D3200, D5100, D7000, D90 **DSLR**	[E]	55-200mm f/4.0-5.6 G DX	$246.95	$100	$146.95
	[F]	55-300mm f/4.5-5.6 G DX	$396.95	$150	$246.95
Buy Lens [G, H, I, J or K] **with** D7000, D300s, D600, D800, D800E, D3x or D4 **DSLR**	[G]	24-70mm f/2.8 G	$1,886.95	$200	$1,686.95
	[H]	24-85mm f/3.5-4.5 G AF-S ED VR	$596.95	$100	$496.95
	[I]	28-300mm f/3.5-5.6 G AF-S VR	$1,046.95	$150	$896.95
	[J]	70-200mm f/2.8 G AF-S ED-IF VR II	$2,396.95	$200	$2,196.95
	[K]	70-300mm f/4.5-5.6 G-AFS VR	$586.95	$200	$386.95

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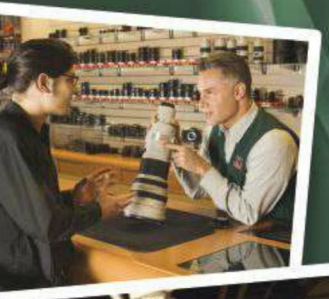

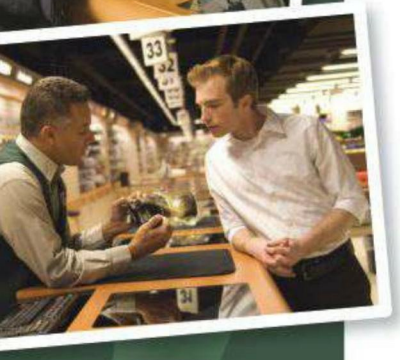

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C = Canon N = Nikon P = Pentax SM = Sony/Minolta SE = Sony E Mount ** Price After Rebate Exp. 12-31-12

		SKU #	Available for	Rebate	Price
Di-II	60/2.0 LD IF Macro (55ø)	#TA602DI*	C, N, SM	$100	424.00**
Di	90/2.8 Macro (55ø)	#TA9028M*	C, N, P, SM	$50	449.00**
Di	180/3.5 LD IF Macro (72ø)	#TA18035*	C, N, SM	$50	689.00**
Di-II	10-24/3.5-4.5 (77ø)	#TA102435*	C, N, P, SM	$50	449.00**
Di-II	17-50/2.8 XR LD IF Aspherical (67ø)	#TA175028*	C, N, P, SM	$75	424.00**
Di-II	17-50/2.8 XR VC LD IF Asph. (67ø)	#TA175028*Q	C, N	$100	549.00**
Di-II	18-200/3.5-6.3 (62ø)	#TA1820035*	C, N, P, SM	$50	249.00**
Di-III	18-200/3.5-6.3 VC (62ø) Black or Silver	#TA1820035S*	SE	—	739.00
Di-II	18-270/3.5-6.3 VC (72ø)	#TA1827035*	N	—	CALL
Di-II	18-270/3.5-6.3 VC PZD (62ø)	#TA18270*	C, N, SM	$100	549.00**
Di	24-70/2.8 VC USD (82ø)	#TA247028*	C, N, SM	—	1,299.00
Di	28-75/2.8 XR (67ø)	#TA287528*	C, N, P, SM	$25	474.00**
Di	28-300/3.5-6.3 XR LD (62ø)	#TA2830035XD*	C, P, SM	—	419.00
Di	28-300/3.5-6.3 XR VC (62ø)	#TA2830035*	C, N	—	629.00
Di	70-200/2.8 LD IF Macro (77ø)	#TA7020028M*	C, N, P, SM	—	769.00
Di	70-300/4.0-5.6 VC USD (62ø)	#TA70300*	C, N, SM	$100	349.00**
Di	75-300/4.0-5.6 LD (62ø)	#TA753004*	C, N, SM	—	164.00
Di	200-500/5-6.3 LD IF (86Cø)	#TA2005005*	C, N, SM	—	949.00
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DX – for Digital SLRs Only **FX** – Designed for full frame DSLRs ** Price After Rebate Exp. 1-31-13

		Canon EOS	Nikon AF	Rebate	Price
FX	100/2.8 Pro D Macro (52ø)	#TO10028PCAF	#TO10028PNAF	—	489.00
DX	10-17/3.5-4.5 ATX Fisheye	#TO0101735CAF	#TO0101735NAF	—	669.00
DX	11-16/2.8 Pro II (77ø)	#TO111628PCII	#TO111628PNII	$40	699.00**
DX	12-24/4.0 Pro II (77ø)	#TO12244DXC	#TO12244DXN	—	499.00
FX	16-28/2.8 Pro	#TO1628FXC	#TO1628FXN	$100	749.00**
FX	17-35/4 Pro (82ø)	#TO1735F4FXC	#TO1735F4FXN	$70	599.00**

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58 AF-2 TTL Digital Shoe Mount Flash 399.99
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45 CL-4 TTL Digital Handle Mount Flash Kit..... 699.99
76 MZ-5 TTL Digital Handle Mount Flash..... 1,039.99

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E-Flash Flat Panel Kit #SUFP38 ..... 58.95
PF20XD Digital Slave Shoe Mount Flash 44.95
RD-2000 Shoe Mount Flash 64.95
DF3000 Digital for Canon, Nikon, Sony..... 79.95
PZ-4000 AF TTL Shoe Mount f/Canon, Nikon..... 79.95
PZ-40x II AF TTL Shoe Mount f/Nikon (Silver)..... 69.95
PZ-42x AF TTL Shoe Mount for Canon, Nikon 139.00
622 Super Pro TTL Handle Mount Flash 179.95

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R – Rear Slip-in Gelatin Filter Slot

		Canon	Nikon	Pentax	Sigma	Sony	Rebate	Price
DC	4.5mm f/2.8 EX Circular Fisheye HSM R	#SI4528EXDCC	#SI4528EXDCN	#SI4528EXDCP	#SI4528EXDCSI	#SI4528EXDSO	$100	799.00**
DG	8/3.5 EX Circular Fisheye R	#SI835CA	#SI835NA	—	#SI835SI	#SI835SO	—	899.00
DC	10mm f/2.8 EX Fisheye HSM R	#SI1028EXDCC	#SI1028EXDCN	#SI1028EXDCP	#SI1028EXDCSI	#SI1028EXDCSO	—	649.00
DG	15/2.8 EX Diagonal Fisheye R	#SI1528DGCAF	#SI1528DGNAF	#SI1528DGPAF	#SI1528DGSA	#SI1528DGMAF	—	609.00
DG	20/1.8 EX DF RF Aspherical (82ø)	#SI2018CAF	#SI2018NAF	#SI2018PAF	#SI2018SA	#SI2018MAF	—	629.00
DG	24/1.8 EX DF Aspherical Macro (77ø)	#SI2418MCAF	#SI2418MNAF	#SI2418MPAF	#SI2418MSA	#SI2418MMAF	—	549.00
DG	28/1.8 EX DF Aspherical Macro (77ø)	#SI2818MCAF	#SI2818MNAF	#SI2818MPAF	#SI2818MSA	#SI2818MMAF	—	449.00
DC	30mm f/1.4 EX HSM (62ø)	#SI3014DCCAF	#SI3014DCNAF	#SI3014DCPAF	#SI3014DCSA	#SI3014DCMAF	—	489.00
DG	50mm f/1.4 EX (77ø) H	#SI5014C	#SI5014N	#SI5014PE	#SI5014SI	#SI5014SOM	$50	449.00**
DG	50/2.8 EX Macro (55ø)	#SI5028MDGCAF	#SI5028MDGNAF	#SI5028MDGPAF	#SI5028MDGSA	#SI5028MDGMAF	—	369.00
DG	70/2.8 EX Macro (62ø)	#SI7028MDGCA	#SI7028MDGNA	#SI7028MDGPA	#SI7028MDGSA	#SI7028MDGSAQ	—	499.00
DG	85/1.4 EX HSM (77ø)	#SI8514C	#SI8514N	#SI8514P	#SI8514SI	#SI8514S	$75	894.00**
DG	105/2.8 EX Macro OS HSM (62ø)	#SI10528MDGCE	#SI10528MDGNQ	—	#SI10528MDGS	#SI10528MDGSM	$200	769.00**
DG	150/2.8 EX APO Macro OS HSM (72ø)	#SI15028AMOC	#SI15028AMON	#SI15028AMOP	#SI15028AMSI	#SI15028AMOS	—	1,099.00
DG	180/2.8 EX APO Macro OS HSM (86ø)	#SI18028AMEOC	#SI18028AMEON	—	#SI18028AMEOQ	#SI18028AMEOS	—	1,699.00
DG	300/2.8 APO EX HSM	#SI30028DGCAF	#SI30028DGNAF	#SI30028DGPAF	#SI30028DGSA	#SI30028DGMAF	—	3,399.00
DG	500/4.5 APO EX HSM	#SI50045DGCAF	#SI50045DGNAF	#SI50045DGPAF	#SI50045DGSA	#SI50045DGMAF	—	4,999.00
DC	8-16/4.5-5.6 HSM	#SI8164556CA	#SI8164556NI	#SI8164556PE	#SI8164556SI	#SI8164556SO	$50	649.00**
DC	10-20/4-5.6 EX HSM (77ø)	#SI102045DCAF	#SI102045DNAF	#SI102045DPAF	#SI102045DSA	#SI102045DMAF	—	479.00
DC	10-20/3.5 EX HSM (82ø)	#SI102035C	#SI102035SN	#SI102035P	#SI102035SG	#SI102035S	$50	599.00**
DG	12-24/4.5-5.6 EX Aspherical HSM II	#SI122445C	#SI122445N	#SI122445P	#SI122445SI	#SI122445S	—	949.00
DC	17-50/2.8 EX OS HSM (77ø)	#SI175028CA	#SI175028NI	#SI175028PE	#SI175028SI	#SI175028SO	$50	619.00**
DC	17-70/2.8-4.0 OS Macro HSM (72ø)	#SI177028DCC	#SI177028DCNQ	#SI177028DCP	#SI177028DCSI	#SI177028DCSM	$50	419.00**
DC	18-50/2.8-4.5 OS HSM (67ø)	#SI185028DOC	#SI185028DON	#SI185028DOP	#SI185028DOSG	#SI185028DOS	—	199.00
DC	18-125/3.8-5.6 OS (Optical Stabilizer) (67ø) H	#SI18125350SC	#SI18125350SN	#SI18125350SP	#SI18125350SI	#SI18125350SS	—	339.00
DC	18-200/3.5-6.3 OS II HSM (72ø)	#SI1820035CQ	#SI1820035NQ	#SI1820035P	#SI1820035SAQ	#SI1820035SQ	$50	449.00**
DC	18-250/3.5-6.3 OS HSM (72ø)	#SI1825035C	#SI1825035N	#SI1825035CP	#SI1825035S	#SI1825035CSN	—	429.00
DG	24-70/2.8 EX IF HSM (82ø)	#SI247028C	#SI247028NF	#SI247028PS	#SI247028S	#SI247028SM	$75	824.00**
DC	50-150/2.8 EX APO OS HSM (77ø)	#SI5015028CA	#SI5015028NA	—	#SI5015028SAF	—	$100	999.00**
DC	50-200/4-5.6 OS HSM (55ø)	#SI5020045DOC	#SI5020045DON	#SI5020045DOP	#SI5020045DSG	#SI5020045DOS	—	159.00
DG	50-500/4.5-6.3 APO OS HSM (95ø)	#SI505004563C	#SI505004563N	#SI505004563P	#SI505004563SA	#SI505004563SM	$150	1,509.00**
DG	70-200/2.8 EX APO OS HSM (77ø)	#SI7020028CQ	#SI7020028NI	#SI7020028P	SI7020028SIQ	#SI7020028SOQ	$150	1,249.00**
DG	70-300/4-5.6 DL Macro Super II (58ø)	#SI703004SCAF	#SI70300456N	#SI703004PAF	#SI703004SA	#SI703004MAF	$25	144.00**
DG	70-300/4-5.6 APO Macro Super II (58ø)	#SI703004DGCA	#SI70300456AN	#SI703004DGPA	#SI703004DGSA	#SI703004DGMA	—	199.00
DG	70-300/4-5.6 OS (62ø)	#SI7030045C	#SI7030045N	#SI7030045P	#SI7030045S	#SI7030045SM	$50	309.00**
DG	120-300/2.8 EX APO OS HSM (105ø)	#SI12030028C	#SI12030028N	#SI12030028P	#SI12030028SI	—	$200	2,999.00**
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DG	150-500/5-6.3 APO OS HSM	#SI150500C	#SI150500N	#SI150500P	#SI150500S	#SI150500M	—	1,069.00
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DG	2x EX APO Tele-Converter	#SI2XDGCAF	#SI2XDGNAF	#SI2XDGPAF	#SI2XDGSA	#SI2XDGMAF	$50	249.00**
DG	EF-610 ST	#SIEF610STC	#SIEF610STN	#SIEF610STP	#SIEF610STSI	#SIEF610STS	$30	135.00**
DG	EF-610 Super Flash	#SIEF610C	#SIEF610N	#SIEF610P	#SIEF610SI	#SIEF610S	$30	225.00**
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SIGMA
18-200mm f/3.5-6.3 DC II OS HSM Digital Lens

- *Designed exclusively for Digital SLRs*
- Focus 1.5' to Infinity
- Mag. ratio: 1:3.8
- 72mm filter diameter
- Weight: 17.3 oz

$50 REBATE!

SIGMA
70-200mm f/2.8 EX APO OS HSM DG Lens

- *Desirable for Digital SLRs*
- Minimum focus: 4.59'
- 34-12.3° angle of view
- 77mm filter diameter
- Tripod collar
- Weight: 50.4 oz

$150 REBATE!

TAMRON
60mm f/2.0 LD IF Macro Di-II Digital Lens

- *Designed exclusively for Digital SLRs*
- Minimum Focus 9.1'
- 55mm filter diameter
- Weight 14.1 oz

$100 REBATE!

Tokina
11-16mm f/2.8 Pro DX AT-X II Wide-Angle Digital Lens

- *Designed exclusively for Digital SLRs*
- WR (Water Repellent) coating
- Minimum Focus 1'
- Magnification ratio 1:11.6
- Weight 1.2 lb

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Flash Head #IMLTFH..$499.95

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Mini LiteTrek (LT) Pack & Charger Kit with CKE Nikon Cable #IMMLTPBPK1	$439.95
Mini LiteTrek (LT) Pack & Charger Kit with CZ Canon Cable #IMMLTPBPK2	$439.95

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Charger for Mini LiteTrek #IMCBP	$49.95	IM-CKE Nikon Flash Cable #IMCKE	$42.95
IM-CZ Canon Flash Cable #IMCZ	$42.95	LiteTrek 4.0 Flash Tube #IMFTFH	$79.95
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	52mm	58mm	67mm	72mm	77mm
UV, Skylight (1B) HMC	16.50	21.50	27.50	29.95	36.20
UV, Skylight (1B) Super HMC	27.89	26.49	33.00	52.95	44.99
Linear Polarizer	16.99	25.00	38.85	36.85	44.90
Circular Polarizer	23.95	29.95	34.95	42.95	38.90
Circular Polarizer HMC	39.95	49.00	55.90	69.00	104.90
"Moose" Warm Circular Polarizer	35.75	39.55	53.90	55.65	91.50
K2 Yel, X0 Yel/Grn, Grn X1, Or G, Red 25A HMC	23.95	28.35	41.95	46.35	60.90
Close Up Set (+1, +2, +4)	39.99	47.35	53.00	63.00	68.00
Close-Up Set HMC (+1, +2, +4)	52.68	64.88	73.00	100.68	145.35
Intensifier – Blue, Green Field, Enhancement (Red)	34.68	39.95	55.08	60.00	71.50
Neutral Density 2x, 4x, 8x HMC	23.88	19.95	36.95	30.99	34.80
Star 6, Star 8	16.89	22.50	43.35	49.90	46.68

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	55mm	58mm	67mm	72mm	77mm
Skylight (1B), UV	39.99	41.99	62.99	77.99	89.99
Skylight (1B), UV SH-PMC	72.99	78.99	103.99	131.99	157.99
Circular Polarizer, Slim Circular Polarizer	115.99	121.99	151.99	180.99	195.99
Circular Polarizer SH-PMC, Slim Circ. Pol. SH-PMC	161.99	171.99	214.99	242.99	275.99
#5, #8, #11, #13, #15, #22, 81A, 81B, 81C	49.99	51.99	78.99	96.99	108.99
Digital Filter	176.99	180.99	222.99	261.99	301.99

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UV Haze MRC - Multicoated	35.51	30.89	44.95	55.00	68.99
Circular Polarizer	71.50	67.91	69.95	74.95	84.00
Circular Polarizer MRC	78.00	74.00	96.03	105.00	124.95
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Skylight KR1.5 (1A)	24.50	24.50	36.00	39.00	49.00
Digital Pro UV MC	38.50	38.50	—	—	—
Graduated (N.D. & Colors)	99.95	106.95	109.50	112.50	119.95
Neutral Density 106	56.00	56.00	88.75	111.50	102.00
Close-Up Lenses 1, 2, 3, 4, 5	24.50	24.50	36.00	42.00	49.00

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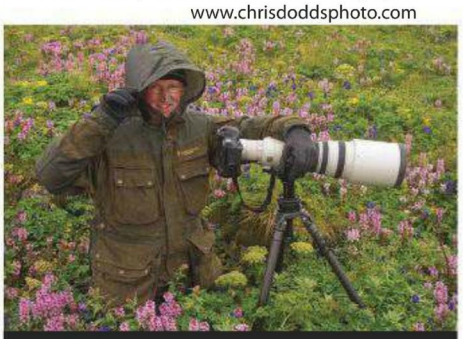

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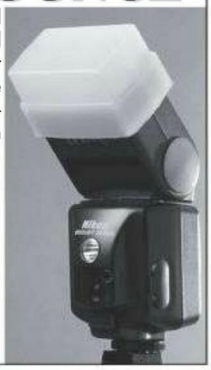

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Maxxum 9000	69.95	Maxxum 5000	39.95	Mamiya 180mm F4.5	149.00	Praktica TL	69.99
Maxxum 5D	199.95	Maxxum 700I	119.95	Minolta 50mm F1.7	19.00	Ricoh XRP	99.99
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Nikon F	99.99	Nikkormat FT2	119.94	Minolta 5400HS	79.00	Canon dial	49.99
Nikon FA	169.99	Nikon F2	119.99	Maxxum 50mm F1.7	69.95	Canon P	239.99
Nikon F3	129.99	Nikon F100	199.99	Nikon 50mm F1.4	69.00	Hasselblad x-pan	999.99
Nikon F5	349.99	Nikon F4	199.99	Nikon 18-200mm F3.5	349.00	Mamiya 500 DTL	79.99
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Nikon N90	99.99	Nikon D40	199.99	Nikon SB600	269.00	Leica CL	499.99
Nikonos V	179.99	Nikon N55	66.99	Nikon SB900	349.00	Mamiya 7	699.99
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Pentax K1000	99.99	Nikonos II	79.95	Olympus 70-210mm F4.5	99.00	Mamiya C220	99.99
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Canon 40D	699.00	Vittrsa	99.95	Vivitar 283 Flash	29.95	Miranda FV	99.99
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Exakta 66	999.99	Zeiss Icarex	149.99	3X Teleconverter Extended Lens	39.95	Contax Ila	139.99
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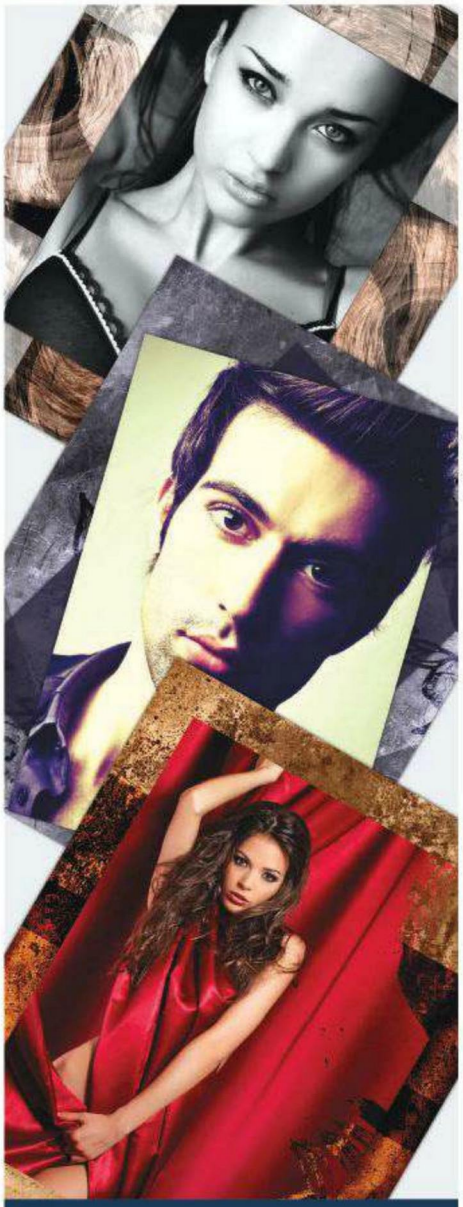

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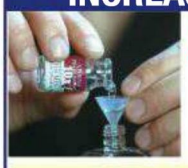

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CONTINUED FROM PAGE 82

At ISO 6400, the A99 held onto Excellent-level resolution with 2525 lines. At that same sensitivity level, the 5D Mark III outstrips the Sony with 2660 lines, while the Nikon D800, with its much higher-megapixel sensor (36.3MP) schools them both with 2900. At the A99's top sensitivity of ISO 25,600, it beats the Canon with 2340 lines to the 5D Mark III's 2150, while the D800 holds the lead with 2470.

Even at its lowest sensitivity of ISO 50, the A99 showed a noise score of 1.6, good enough for a Low rating on our scale. But compare that to the 5D Mark III that scored 0.9 for an Extremely Low rating. While the A99 holds its Low rating up to ISO 800, the Canon doesn't reach a Low rating until ISO 6400. By that point, the A99 already hits Unacceptable territory in our test. Nikon's D800 also became Unacceptable by ISO 6400, but showed lower noise at ISO 50 with a score of 1.3, earning it a Very Low rating.

Interestingly, Nikon's recently released D600 uses a Sony-made 24.3MP full-frame sensor that many people speculate is the same one used in the A99. However, Nikon was able to keep noise to a Low or better rating all the way up to ISO 3200.

In our color accuracy test, the A99 barely achieved an Excellent rating with an average Delta E of 7.9. Both the 5D Mark III (6.9) and D800 (6.8) earned the same rating, but with better scores.

One place where the Sony A99 did exceptionally well is in autofocus speed. This is a new Hybrid AF system, so it's especially impressive that the A99 proved the fastest in its class. At EV12, the brightest light level in our test, the A99 showed blazing speed by focusing in 0.27 second. It wasn't until EV6, the equiva-

lent of a very well-lit room, that it fell to 0.36 sec, faster than either the 5D Mark III or the D800 at their best. Even down in the moonlight-like level of EV –1, the A99 focused in less than a second. At EV –2, the dimmest in our test, AF became significantly erratic in its speed, but averaged about 1.14 seconds.

In the field, though, we noticed that the AF sometimes faltered in dim light and hunted quite a bit. This became frustrating and ended up in a few missed shots during one shoot. While this didn't happen often, it did shake our confidence in the AF a little.

In the Field

We covered most of our field testing observations in our November 2012 Hands On report on a preproduction model, and nothing changed for the worse in the final production sample of the A99 that we tested this time.

However, we want to give a shoutout to the focus-peaking feature, which wasn't operative on the early sample—this can be amazingly helpful when you focus manually. When shooting portraits, for instance, you can see the surface of your subject's eye light up to let you know that your focus is spot on. With landscape shots, you can see the focusing distance and place it in the perfect location in the scene. Rarely do we encounter a new feature as helpful as this one.

The Bottom Line

Even though the Canon won our 2012 Camera of the Year award (see page 58), the Sony A99 remains one of the best new cameras we've seen this year. It shows that the new perspectives being brought to photography by the likes of traditional electronics companies are having a positive effect on the progression of photographic technology.

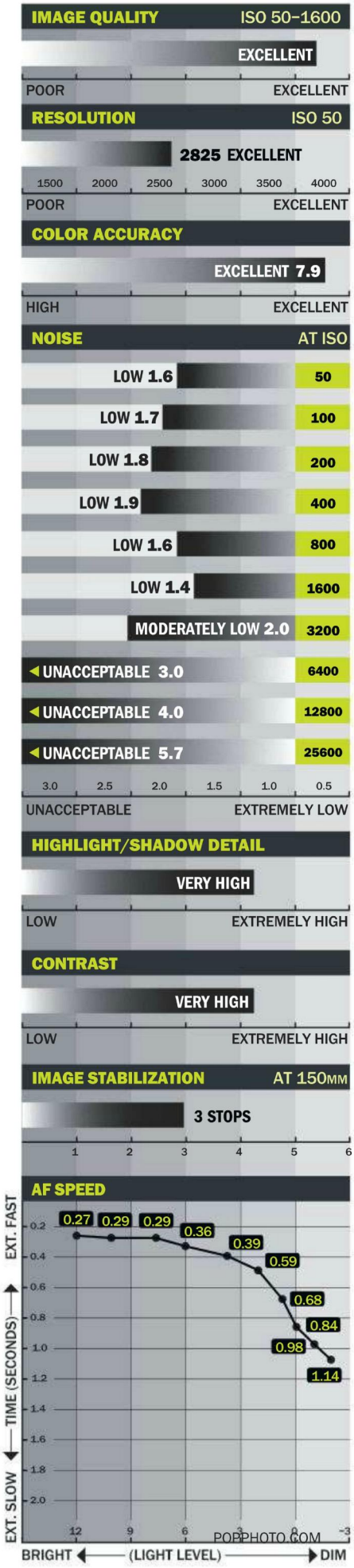
If you're a Sony shooter already and looking for a full-frame body, the A99 is a no-brainer. If you're considering your first DSLR, you can feel safe investing in the Sony system.

The A99 is just another reminder of how serious Sony is about this business and how intent it is to be among the top echelon of camera makers. If the past few years are any indication, it will play a major role in bringing photographic technology to new heights. *—Philip Ryan*

The A99 is the first Alpha to eschew the unique Minolta-type hot-shoe in favor of a conventional type that can accept a number of new accessories for Sony's Alpha and NEX cameras.

SHOWN WITHOUT LENS

TEST RESULTS



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LAB * LENS TEST

SIGMA 18-250MM F/3.5-6.3 DC MACRO OS HSM

CONTINUED FROM PAGE 84

while dipping through Good to Average at 250mm. To compare, Tamron's 15X zoom also dropped into the Average range at its longest focal length, while the previous Sigma 18–250mm held sharpness and contrast in the Good range.

In DxO Version 4.1 tests, its Visible distortion (at 18-, 35-, and 100mm) were high by today's standards, but about normal for all-in-one zooms. The lens really excelled in the macro range, where pincushion distortion at 250mm dipped to Imperceptible. It nearly matched its predecessor's excellent vignetting control: Light falloff was gone by f/4 at 18mm, and none was detected at the three other tested focal lengths or in the macro range.

Despite some optical compromises, this compact lens will please photographers who want to travel light. Its nonrotating barrel is well suited to accessories, its AF is faultless, and its OS system is very handy. *—Julia Silber*

SUBJECTIVE QUALITY FACTOR

Our standard lens test, SQF rates sharpness by print size

18 MM

Size	5x7	8x10	11x14	16x20	20x24
3.5	95.5	94.1	90.9	84.3	76.3
4.0	95.5	94.1	90.8	84.2	76.2
5.6	95.6	94.2	91.0	84.7	76.9
8.0	95.6	94.3	91.1	84.7	77.0
11.0	95.7	94.4	91.2	85.0	77.5
16.0	95.5	94.1	90.9	84.4	76.6
22.0	95.0	93.4	89.7	82.2	73.0

35 MM

Size	5x7	8x10	11x14	16x20	20x24
4.5	95.6	94.2	91.1	85.1	78.1
5.6	95.6	94.2	91.1	85.1	78.0
6.3	95.6	94.3	91.1	85.2	78.3
8.0	95.7	94.4	91.3	85.5	78.7
11.0	95.6	94.2	91.1	85.1	78.2
16.0	95.4	94.0	90.6	84.4	77.1
22.0	94.8	93.3	89.5	82.3	73.7

100 MM

Size	5x7	8x10	11x14	16x20	20x24
5.6	95.6	94.2	91.1	85.4	79.0
6.3	95.6	94.2	91.0	85.3	78.8
8.0	95.8	94.3	91.2	85.6	79.3
11.0	95.6	94.3	91.2	85.7	79.4
16.0	95.4	93.9	90.6	84.7	77.9
22.0	94.7	93.1	89.3	82.1	73.7

250 MM

Size	5x7	8x10	11x14	16x20	20x24
6.3	91.1	86.5	73.0	54.8	43.4
8.0	91.1	86.5	72.9	54.6	43.3
11.0	91.8	87.6	75.6	58.7	47.7
16.0	92.2	88.3	77.3	61.3	50.3
22.0	92.2	88.3	77.3	61.3	49.9

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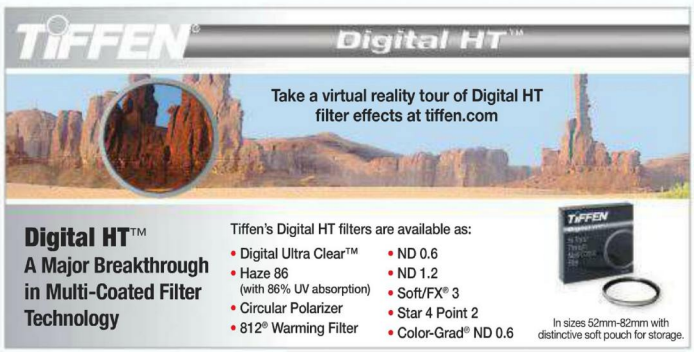
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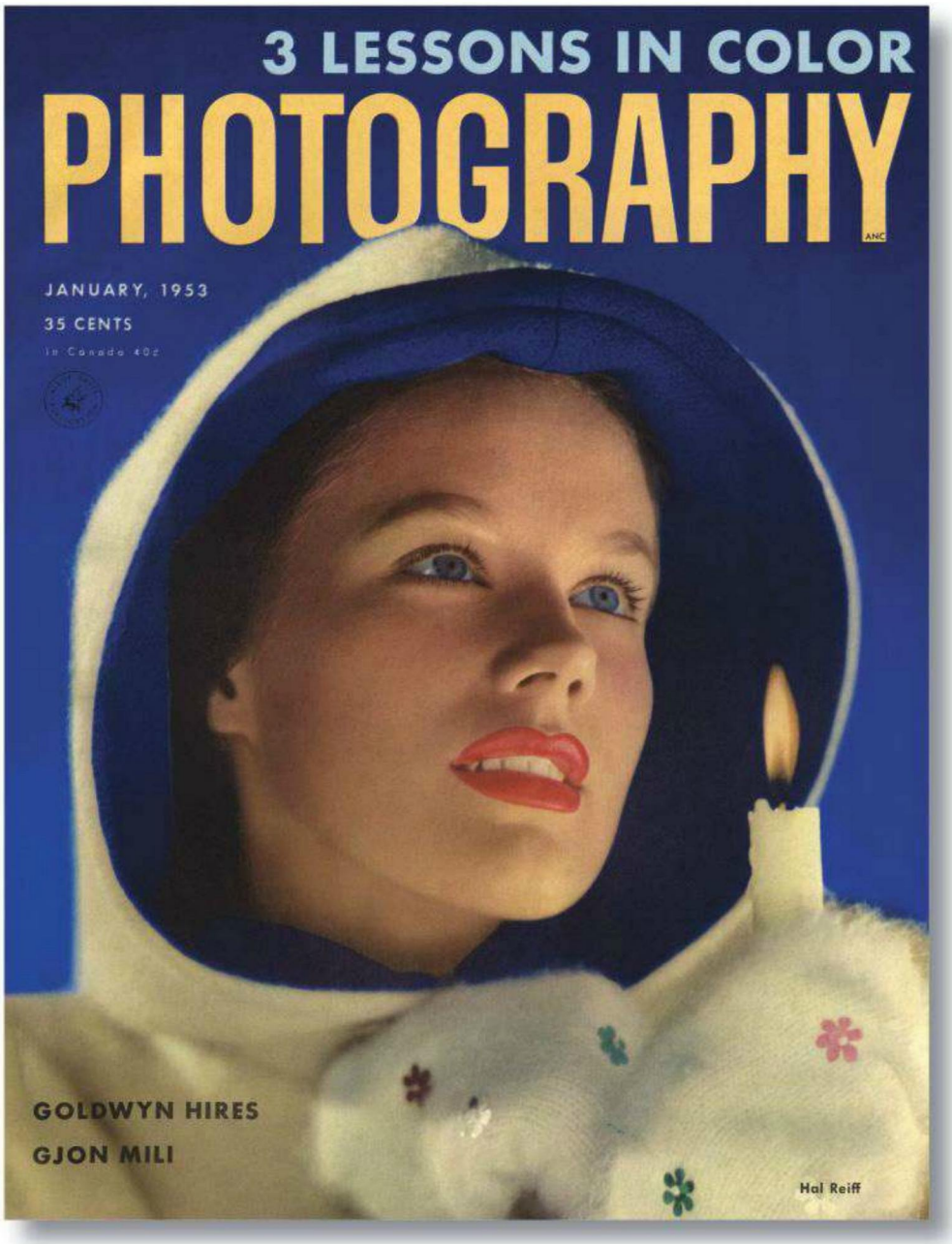


▲ Winter Wonder

New York City-based fashion photographer Hal Reiff created this month's cover shot in the course of an assignment for a fashion magazine. The model in the parka is Diane Stevens. Reiff placed his key light below the level of his model's face to maintain the candlelight effect. He took the picture with an 8x10 Deardorff view camera fitted with a 12-inch Kodak Ektar f/6.3 lens. Exposure on Type A Kodachome film was 1 sec at f/8.

60 YEARS AGO

With just two pages printed in color inside each issue, this month we ran a full-page glamour shot and three color photos from readers.

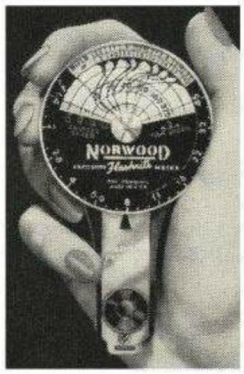
▼ Handy Bounce

One of the most versatile lighting techniques for photographers is bounce lighting, in which the light source is reflected (bounced) rather than directed at your subject. An article in this issue of the magazine by H.B. Wright, covering both flash and flood sources, provided a thorough guide to this unsung technique. It was just this type of hands-on, how-to articles that made *Popular Photography* tops in its field.

▲ Howdy Santa

Ruth Orkin, a photojournalist based in New York, was noted for her sensitivity to the everyday events in people's lives. A wonderful example is this series of candid shots taken in Macy's during the Christmas season. Typical is this engaging picture of a little boy shaking hands with Santa Claus. Orkin used a Contax with 50mm f/1.5 Sonnar and Kodak Super XX film. Exposures for the series ranged from f/3.5 to f/1.5 at 1/25 sec.

▼ How Bright Is the Flash on My Camera?



Before cameras had automatic flash functionality, photographers had no choice but to set their exposure based on the distance between their flash and their subject. To make life easier for photographers, the Norwood Flashrite exposure meter coupled a flash calculator to a rangefinder. As the photographer measured the distance with the rangefinder, the correct exposure could be read from the calculator dial. At the wallet-friendly price of $12.95, this made a dandy Christmas gift. *—Harold Martin*

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TOKINA REFLEX 300MM F/6.3 MF MACRO

CONTINUED FROM PAGE 86

grip, which you'll need because the focusing is overdamped—it takes a good bit of manual oomph to turn it. On the upside, the action is silky smooth and silent, and the 290-degree turning radius provides the fine focusing you need with a supertele optic.

Handholding this optic while viewing on the LCD is, in a word, impossible; you'll want an eye-level finder for the extra bracing it provides. The lens balanced exceptionally well on the Olympus OM-D E-M5 camera we used.

We could not test SQF due to the lack of a Micro Four Thirds lensmount for our optical bench. But DxO Analyzer 4.1 tests showed Slight (0.15%) pincushion distortion and virtually no light falloff at its one aperture, f/6.3. DxO also showed some lateral chromatic aberration across the field, with one corner considerably worse than others.

In the field, the lens produced images that were a touch soft, and, typical of mirror lenses, somewhat low in contrast, especially in backlight. But flare was very well controlled. The lens also rendered the typical donuts in out-of-focus highlights.

For wildlife or sports use, we'd strongly recommend a tripod, or at least a monopod. Given this Tokina's slow focusing, it would be best to prefocus on an area where you expect your subject to be, rather than try to follow focus.

Is this lens worth it? The 100–300mm f/4.0–5.6 Lumix G Vario OIS Lens for Micro Four Thirds streets for $499 and gives you zoom, autofocus, and a range of f-stops. It is, however, just about twice the weight and length of the Tokina. So ILC owners looking for an incredibly compact supertele might well consider this donut maker. —*Dan Richards*

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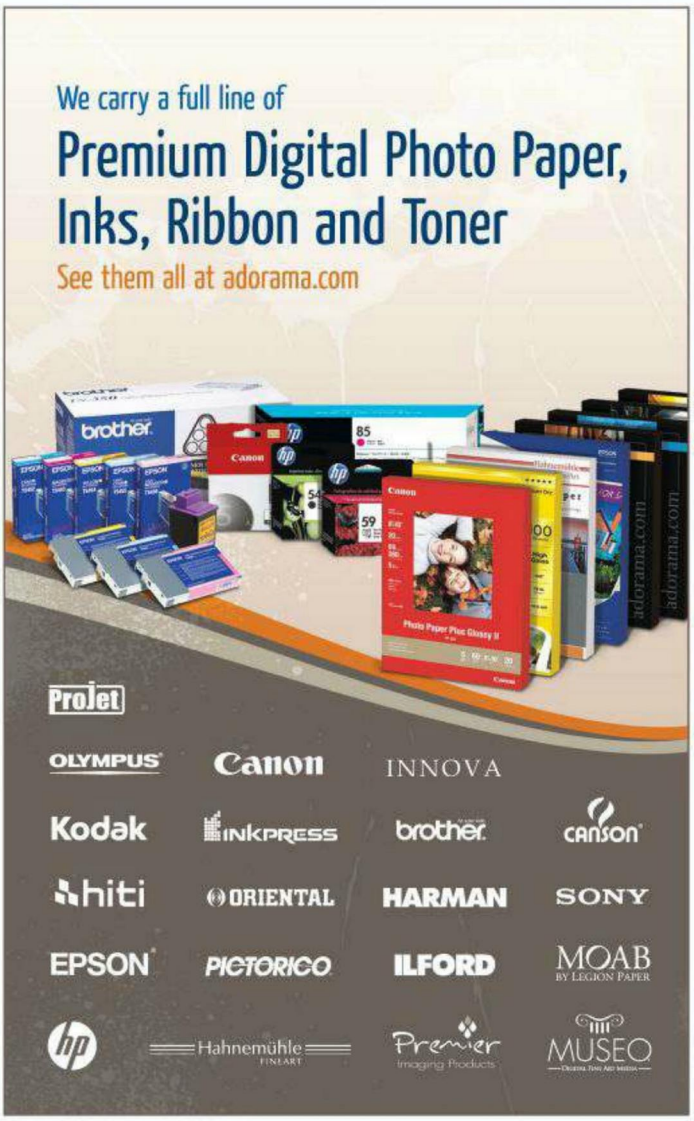

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The Flashpoint DG600 can be operated cord-free with an optional battery pack (far right), ideal when on-site electricity is unavailable.

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Bringing lights on location greatly expands a photographer's creative options, but their weight and bulk makes getting them there a struggle. Lessen your load with Adorama's new **FLASHPOINT** DG600 AC/DC Digital Monolight. It combines power source, controls, and flash head in a single unit—yet weighs just a few pounds and is *half* the size of comparable monolights.

Despite its compactness, our new strobe packs the power you need, with a pair of units steplessly delivering up to 600 watt-seconds of consistent 5600K light. What's more, a recycle time as fast as half a second and a flash duration as short as 1/1500 second mean you can shoot fast and with little risk of ghosting.

The **FLASHPOINT** DG600's big digital display makes settings easy to read, and its sturdy, fan-cooled housing features a secure, rubberized surface. Why pay more?

FLASHPOINT Easy-Shoot Solutions

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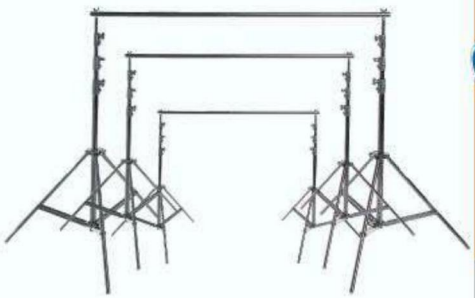

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The top of the stand meets the crossbar there is a screw and wing nut to keep the crossbars secured to the stands.

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TRIPOD REPORT

Supporting Role

Flashpoint tripods & heads

Why every photographer needs a good tripod. By Marvin Good

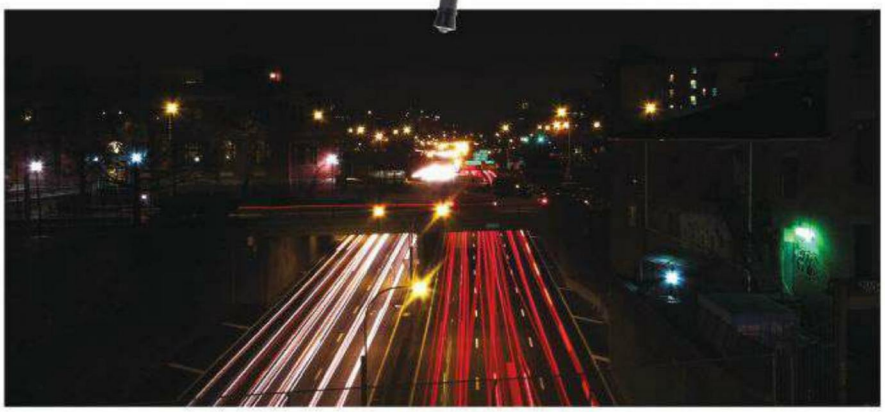
Right: Two of the top Flashpoint carbon-fiber tripods, the twist-lock Flashpoint F-1428N and the lever-lock Flashpoint F-2328N ($229.95), plus the muscular Flashpoint F-4 ball head ($114.95).

The most unappreciated, underused piece of equipment in all of photography is without a doubt the tripod. Even photographers who understand a tripod's value are often reluctant to spend money on one. It's money well spent—but you don't have to pay a lot to get a good tripod.

Flashpoint tripods, tripod heads, and monopods offer the features and quality of big-brand competitors at a fraction of the cost. The Flashpoint F-1428 tripod, for example, is made of 8X carbon fiber, which gives it high strength without excess weight. It can support a camera and lens weighing over 26 pounds, yet weighs less than six pounds itself. And while the F-1428 rises to six feet when you extend its center column—great for high angles and tall photographers—it collapses to two feet in length thanks to the four-section design of its rubberized twist-lock legs. (The column is reversible for low-level work.)

Prefer fast-action lever-locks? Take a look at the carbon-fiber Flashpoint F-2328. Like the F-1428, it supports over 26 pounds in camera and lens weight, features a built-in bubble level for easy alignment, yet weighs even less than its twist-lock sibling!

Before you moan and groan about the nuisance of carrying a tripod around, consider what it can do for you. First and foremost, it gives you tack-sharp pictures at slow shutter speeds that would cause blur if you were to handhold the camera. What about the in-camera image stabilization found in most of today's DSLRs? Sure, it gives you an edge—but since everyone's degree of steadiness is different, you never really know how slow you can safely go. And the damage isn't always obvious blur. Sometimes shaky hands just cause an irksome lack of crisp detail that you may have been blaming on improper focus. A tripod insures that this won't happen.



Photographer: Sandy Ramirez

One classic photographic effect that requires a good tripod is turning car lights into streaks with a long exposure, achieved here with a Flashpoint tripod.

A tripod is especially important when you're using a long lens, such as a telephoto for wildlife photography. That's because the longer a lens, the greater the chance of blurred results. This is why long-lens photographers set high shutter speeds for handheld shooting—but they're still often pushing their luck. A tripod is the best insurance that they'll come back with sharp shots. And as a side benefit, a tripod keeps the viewfinder image from jumping around the way it does with a handheld telephoto, letting you frame the subject more precisely.

Even at less extreme focal lengths, a tripod is an important compositional tool, providing precision and repeatability you can't get handheld. It means that bracketed exposures will all have the same framing. And it's essential for exact matching of frames with HDR imaging.

To learn more about which Flashpoint tripod is right for your kind of photography, visit the Flashpoint store at Adorama.com. (Just type "Flashpoint carbon" into the search field.) You'll find a tripod for every purpose, from the models mentioned here all the way down to ultra-light travel tripods, plus everything in between. You'll also find a complete line of Flashpoint tripod heads for these models, as well as Flashpoint monopods—single-legged supports that offer a compromise between stability and mobility. But that's a discussion for another time!

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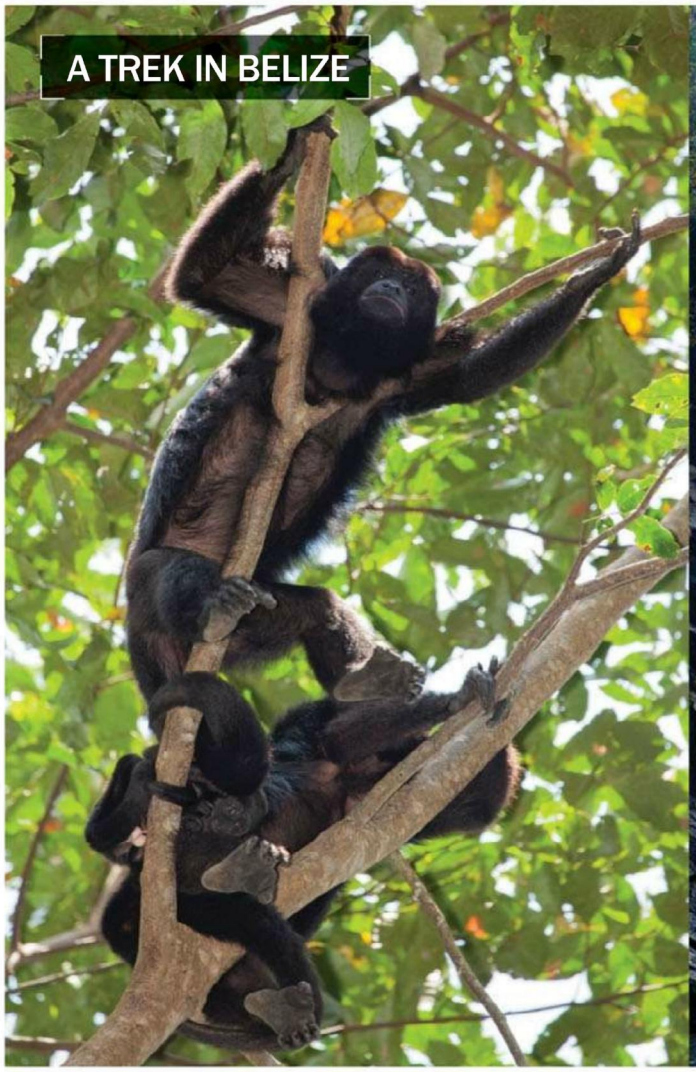


BIG ROCK FALLS, MOUNTAIN PINE RIDGE FOREST
Plant hiked into the reserve after an hour's drive on a bumpy dirt road. For the blur in the water, he set an exposure of 1/8 sec at f/11, ISO 50, on his 5D Mark II, used with a 24–105mm f/4L Canon EF lens and polarizer.

CONTINUED FROM PAGE 56

must when handholding shots in Belize's dark jungle environments. I found my 100–400mm zoom to be a good compromise between reach and portability.

Discover Ancient Artifacts

If you are looking for a short break from nature photography, visit Belize's ancient Mayan ruins. Excellent sites can be found in Lamanai near Orange Walk (the river tour to Lamanai is also great for photographing wildlife); Caracol near San Ignacio; Xunantunich near the Guatemala border; and Altun Ha, 35 miles north of Belize City.

World famous Tikal is just across the border in Guatemala, and many Belize tours travel there.

Planning Your Trip

Belize's tropical climate is relatively stable year-round, with little seasonal variation in temperature. The rainy season is from June through November, although you won't necessarily get constant rain at these times. Early in the year is relatively dry and sunny, a perfect time for your visit (but remember that clouds can add color and dramatic skies in landscapes shot at sunrise and sunset).

HOWLER MONKEYS, MONKEY RIVER
A Canon Speedlite 580EX II set to –1 EV balanced the exposure of the shadowed monkeys with the sky above. Canon EOS 5D Mark II with 100–400mm f/4.5–5.6L Canon EF IS; 1/125 sec at f/5.6, ISO 400.

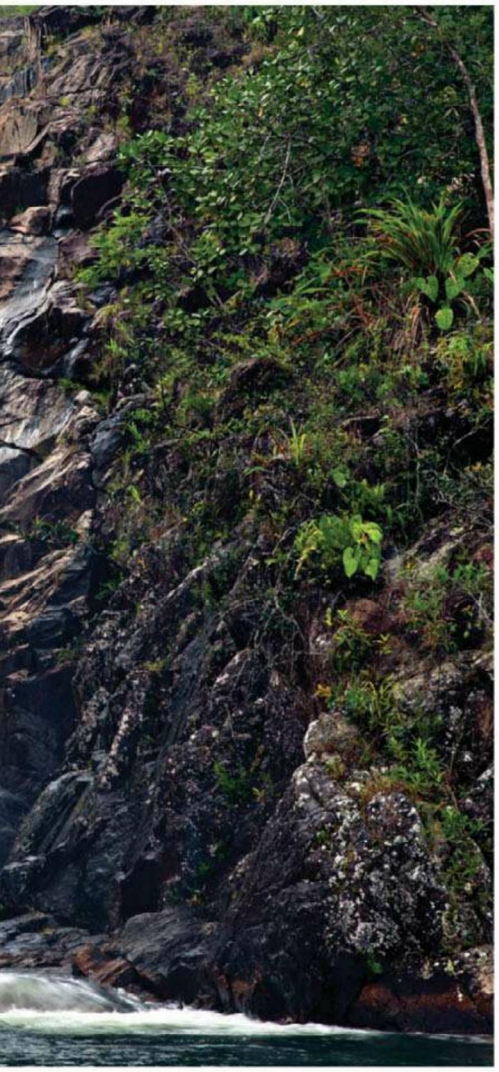
Offshore winds can sometimes blow fairly steadily, which might make taking a boat tour to Belize's islands and barrier reef a bit choppy, if not impossible. Choppy seas also reduce water clarity for underwater photography, so try to plan any snorkeling or diving for calm days.

International flights arrive at Philip S.W. Goldson International Airport, just outside Belize City. You don't need to get a visa to enter Belize (your passport will do); you will be issued a tourist visa when you arrive. Options for local air travel and rental cars are available at the airport.

The Belize dollar is pegged to the U.S. dollar at a 2-to-1 ratio. Most retailers take U.S. currency, and credit cards are widely accepted. Lodging in major tourist areas ranges from inexpensive-but-clean to luxury, and will be more spartan in remote areas.

Although most of Belize is safe for tourists, the U. S. State Department recommends exercising caution in Belize City, as well as near some border areas. And although vaccinations are not required to enter Belize, you may want to consider consulting with your doctor prior to travel.

The coastal tourist towns can be reached by small plane, but a rental car will be useful if you wish to explore the interior. Most



rental companies offer four-wheel-drive high-clearance vehicles as their standard because many of Belize's roads are not paved and some are exceptionally bumpy. Belize's bus system is also an option. Or you can join half-day or day-long tours, which originate from most tourist towns and allow you to visit the country's top attractions.

Belize's official language is English, although Kriol, Spanish, Garifuna, and various Mayan dialects are the first languages of a majority of Belize's people. But with the possible exception of people living in remote areas, most Belizeans speak English very well.

Full-time professional nature photographer Ian Plant is the author of a number of e-books and digital-processing video tutorials. See more of his work at ianplant.com.

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CAMERA OF THE YEAR

CONTINUED FROM PAGE 60

note that Nikon's new D600 produces higher resolution using a Sony sensor of the same size.

We see the A99 as building on, rather than pioneering, transmissive-mirror technology—that distinction belongs to the Sony Alpha 77, our 2010 Camera of the Year. We also felt that, since our readers are primarily still shooters, the advanced video capability of the A99 is not as compelling a factor.

You may no doubt wonder about the absence of 2012's two new supercameras, the Canon EOS-1D X and the Nikon D4. While these top-of-the-line DSLRs are awesome in their burst rates and tank-toughness, they are not so awesome in imaging—both barely cracked the threshold for an Excellent resolution rating. So their refinement is, in a word, incremental.

With Canon's EOS 5D Mark III, Nikon's D800, and Sony's Alpha 99, though, these three manufacturers have in effect created a new class of supercamera—one more within the reach of the rest of us. And that's pretty super.

HONORABLE MENTIONS

The Also-Rans

TWO OTHER models received serious consideration for Camera of the Year. Both are adventurous takes on the interchangeable-lens compact (ILC) concept, and both are derivative of classic film-camera styles.

Photographers with a certain historical perspective might mistake them for an M-series Leica rangefinder or an Olympus OM-series SLR. But the Fujifilm X-Pro1 (the neo-rangefinder) and the Olympus OM-D E-M5 (the retro *faux*-SLR) are great examples of what imaginative engineers and designers can do with today's digital technology in cameras that are neither rangefinders nor SLRs.

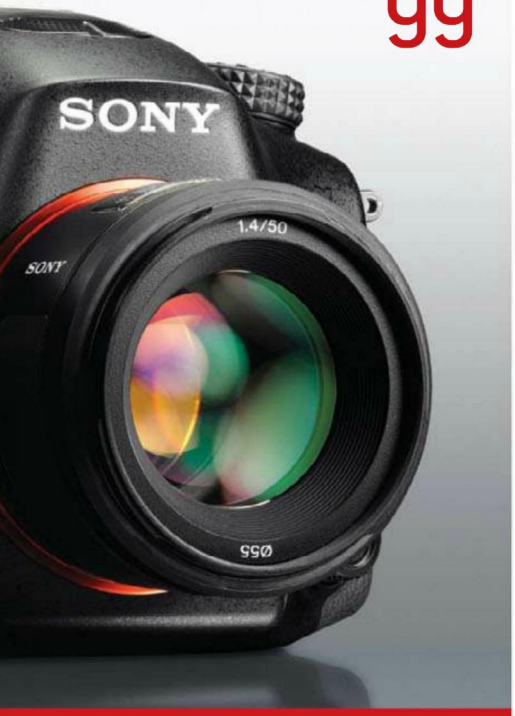
We loved the Fujifilm X-Pro1 for its concise control layout, fine handling, and classic looks. The camera has several technological innovations, like the hybrid optical/electronic viewfinder. And it breaks new ground with its 16.3MP X-Trans sensor, which uses a more sophisticated pixel array than the traditional Bayer pattern and foregoes a low-pass filter. Our review was mixed: It produced very sharp images—resolving an average of 2400 lines—but the resolution varied widely depending on the direction of measurement.

The Olympus OM-D also proved a heart-throb. It has an easy-to-understood control layout, good ergonomics, a very fine-grained EVF, and a handsome exterior. Performance matched the style: The OM-D put up Excellent image quality from its 16.1MP Four Thirds sensor, the sensor-shift image stabilization averaged 3 stops of extra handholding leeway, and, with some compromises, the camera shoots JPEGs at 9 fps. The lens line for Micro Four Thirds continues to grow, with new glass coming regularly from Olympus, Panasonic, and the independent lensmakers.

We suspect that the handsome OM-D will lure some away from bigger, heavier gear.

CONTINUES ON PAGE 110

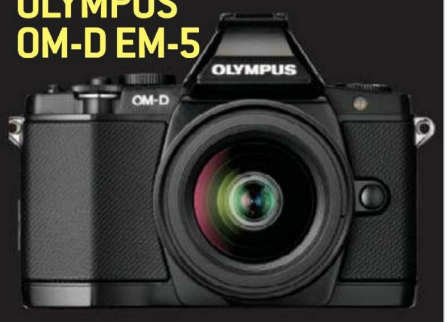
Sony Alpha 99



But as much as a refinement as the OM-D is, it breaks no new ground in the technology. In the end, 2012 was the year of the full-framer, and the Canon EOS 5D Mark III was the full-framer to beat. And nobody beat it.

FUJIFILM X-PRO 1

OLYMPUS OM-D EM-5



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Drained Dreams

CHRISTOPHER BEAUCHAMP/WONDERFUL MACHINE

Christopher Beauchamp captures luxury in decay

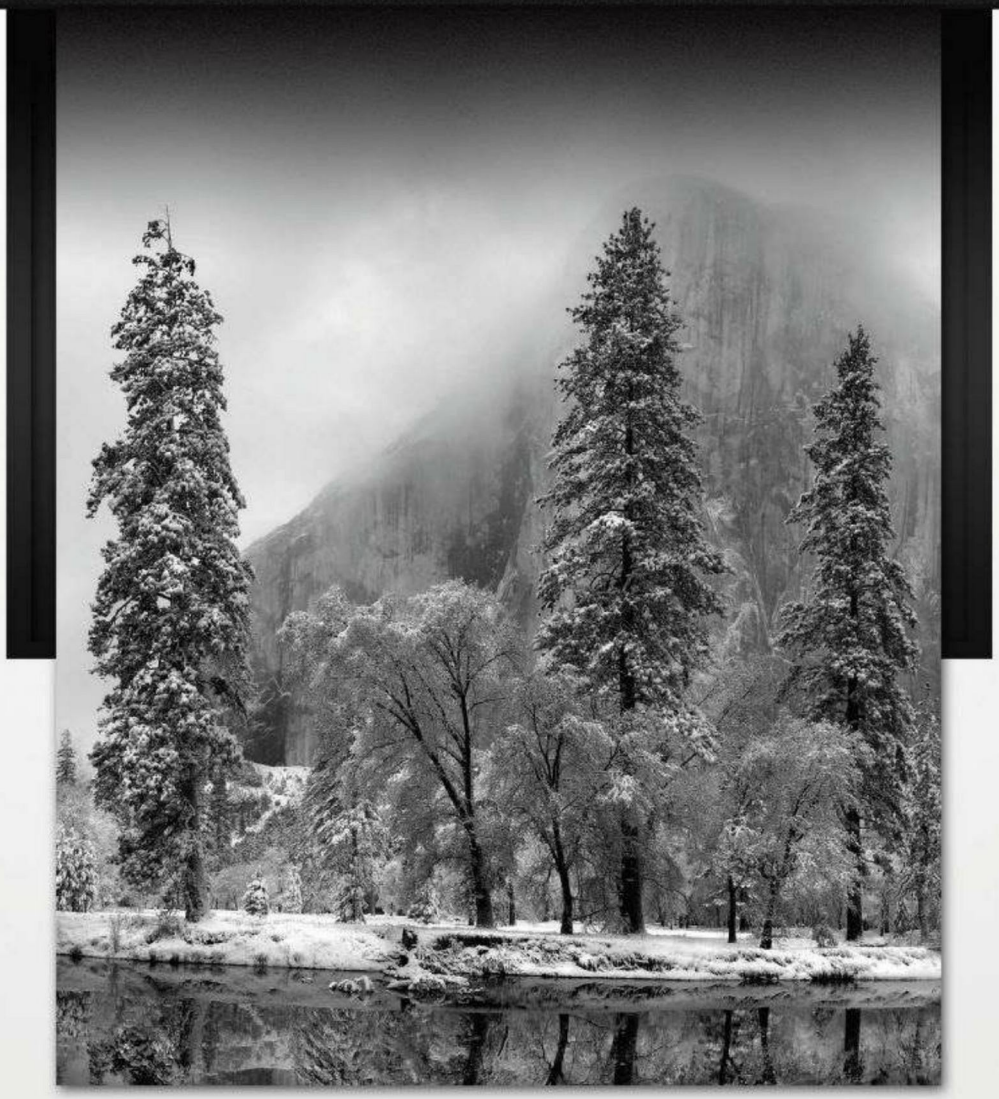
15 YEARS AGO I got involved with an art group that would repurpose abandoned spaces for performances. I started exploring them, first with the idea of using the spaces, then to photograph them. They speak to our impermanence—to everything's impermanence. In these places, you realize that everything is just on loan from Mother Nature.

This was shot in one of many now-defunct resorts up in New York's Catskills, which was once the place to be for vacations. The pool had visual impact—the chairs reminded me of a mass grave. Climbing on a ledge for a better angle, I looked down and noticed strips of 120 film lying on the floor. Knowing that someone had already been there pushed me to make a better picture.

It's interesting to create a photograph in a place that makes you conscious of temporality, and that everything around us will one day crumble and fall apart.

—As told to Lori Fredrickson

PIXMA



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